AMERICAN GAS ASSOCIATION MONTHLY

Vol. I No. 3

March 1919

This issue of the Association Monthly contains a complete report of the proceedings of the Conference held on March 13 and 14 in New York. It also gives in full, the address of the President of the Association and the progress reports of committees of the Technical Section.

In the April number will appear the complete text of the various papers and addresses presented at the Conference, including the remarks of Hon. William C. Redfield, Secretary of Commerce.

This issue prints for the first time, a complete buyers' index of Association members and gives in full the affiliation agreement for local or geographic gas societies that desire to co-operate with the American Gas Association.

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AMERICAN GAS ASSOCIATION
MONTHLY

ADDRESS ALL COMMUNICATIONS TO THE AMERICAN GAS ASSOCIATION, 130 E. 15th ST., NEW YORK, N. Y.

Editor, ... Louis Stotz
Associate Editor, . T. M. Will

Vol. I MARCH, 1919 No. 3

WITH THE EDITOR.

Go Ahead

There could be no question as to the unanimity of opinion at the March Conference of gas men, on the immediate policy to be adopted by our industry. Addresses, discussions, votes, applause—all indicated the sentiment for progress—for an immediate resumption of activities on even a greater scale than existed before the war. Mr. Alexander, Managing Director of the National Industrial Conference Board, declared that industry and labor are ready to co-operate in the correction of faulty conditions of long standing; the hesitation is only a wait for exact data. Secretary Redfield said "There are so many questions crying out for consideration and so many of them are new. There are strange responsibilities involved in them and shocks to our old-time ways of thinking. * * * The Government must remove as quickly as possible every war-time restriction on anything we sell or anything that makes it more difficult to transact the normal movements of commerce. We should, as rapidly as possible, get men to earning money." President Cortelyou himself said "Each industry has an essential part in the National life. It exists for something more than to support its promoters. * * * If it has a history, it behooves it to study that history. But in this new epoch it will be pushed aside and overwhelmed if it be content to be guided only by its past. Industry must rise to its new opportunities and responsibilities. Ours must shake off whatever of timidity or inertia has developed in its century of life."

In other words, labor, industry and Government stand ready to go ahead, and the industry which was represented at the Conference of March 13 and 14 emphatically expressed its desire for progressive policies. That this progress is to be essentially solid was indicated by the recurrence of the plea for exact data—exact data for the gas man himself so that he may know just what each consumer costs, scientific analysis of kinds of business, load factors, territories, and exact data for the public that constitutes our market.

The clinching argument on the side of progressive policies, however, took the form of an overwhelming vote in favor of an Advertising and Publicity Section in the American Gas Association. Definite plans for the Section's work have not yet been outlined and the actual degree of its value to the industry as a whole will, of course, depend largely upon the nature and aggressiveness of those plans. The significant fact is that 200 gas men in conference assembled, by a large majority, expressed themselves in favor of a policy of gas publicity at once broad in its appeal, wide-spread in its extent and unceasing in its perseverance.

May we add that now is the time for every gas publicity man to get into communication with Association headquarters, with an expression of his opinion as to the details of the work which the Advertising Section should carry on?

Died of Wounds

Mr. Clarence V. Roberts, of the Roberts & Mander Stove Company, has written us concerning the death on March 2, in the Polyclinic Hospital of New York, of Lieutenant J. Warren Guise, 11th Infantry, U. S. A. Lieutenant Guise died from severe wounds in the chest and arm, received during the St. Mihiel drive, in late September. He was a representative of the Roberts & Mander Stove Company in the Philadelphia district and had the entire respect of all who knew him.

AMERICAN GAS ASSOCIATION MONTHLY

Vol. I MARCH, 1919 No. 3

Address of George B. Cortelyou, President of the American Gas Association, at the March Conference of the Association, Hotel Astor, New York City, Thursday, March 13, 1919

Gentlemen of the American Gas Association:

THIS conference meets at a time of world-wide reconstruction and readjustment. History records no other similar period, either in the diversity of its aspects or in the magnitude of its problems. Nations and groups and individuals find themselves in radically new relations. Mankind is to measure results primarily by the yard stick of service and not of self-interest, by what we give rather than what we get in our labors. But the fact must not be lost sight of that self-interest, properly directed, has ever been oné of the guideposts along the pathway to ordered liberty, and no scheme of government or business or society will be found suited to human affairs that unduly subordinates it either in international relations or in the daily life of the people.

How to obtain a nice balance of these elements in government and business, to foster and safeguard among men the priceless rights of "life, liberty and the pursuit of happiness," as we in America pronounce them, is engaging the best thought of the best minds of our time.

I am not one of those who believe that in this changed world in which we find ourselves, human nature is to be essentially different. Not even the cataclysmic overturn that has occurred could bring that about. But men and women will have an entirely new viewpoint upon many phases of life. Just as the individual will see things in new relations, so business, as we use the term—the great world of trade and commerce—will witness vast alignments and adjustments to meet new conditions thrust upon us by mighty events. With all the change, however, it will remain true in the future, as in the past, that all real success, all genuine achievement, will be rooted in character; that in the words of the old formula, "honesty, courage and common sense" will remain essentials, whatever other mental or moral qualities there may be, and as true of an industry as of an individual.

Industry has a great part to play in this period of readjustment. It houses and feeds and clothes and lights and heats the world to-day. It supports education and the refining and ennobling influences of life. Its exchanges of communication and of products are the arteries of trade. Its returns are the inducement to enterprise and inventive genius, to hard work and faithful performance of duty. No people can long prosper, or even endure, unless their industrial relations are upon firm foundations. with fair dealing as their practice and justice as their aim.

If this be true, as it is, each industry has an essential part in the national life. It exists for something more than to support its promoters and to give employment to men and women. It is a part of a mighty whole. If it has a history it behooves it, of course, to study that history and profit by its teachings. But in this new epoch it will be pushed aside and overwhelmed if it be content to be guided only by its past. The trumpet call of the present and of the future sounds to-day and we must decide whether we are to be leaders or laggards. Industry must rise to its new opportunities and responsibilities. Ours must shake off whatever of timidity or inertia has developed in its century of life. It must henceforth be in the best sense militant, with its house in order, its ranks formed, its face to the front and its aim and ideal—service, the greatest possible service at the least cost consistent with sound business practice.

I speak this morning, therefore, not of the past, save in necessary reference, but of the present and future of the gas industry. Its history has been recorded in many books and in many tongues. To a body of gas men as representative as this, to define its outlines, to recount the periods that mark its greater achievements, would be to recall only that to which you all have ready access. So our purpose, while paying our tribute of unbounded respect and appreciation to the builders and workers through whose genius and devotion the industry has grown to its present world-wide dimensions, is to look ahead and to bring home to ourselves and to all who serve it a realization that what is past is but the foundation upon which we must build, broadly and securely, for the future.

In line with that purpose, we are met to confer upon the conditions and problems confronting our business, to discuss certain concrete questions affecting it, and to devise ways to make this great national association, chosen to represent it, a source of helpfulness and inspiration to its members and to the public.

Inspiring indeed is the report I make to you of the industry's part in the great war, and that is so recent and so important that in referring to it for a moment I am not deviating from the announced outline of these remarks. Where all did so splendidly it is not possible to single out any one for special mention. It is no exaggeration to say that the war could not have been successfully carried on without the aid of the gas industry; and the industry, in the language of the day, made good. It more than made good. It met a great emergency promptly and with high efficiency. It supported the Government and all the forces of liberty and civilization, and many of those who magnify its occasional shortcomings might well search their own hearts for a sign of similar patriotic service. Its spirit in the crisis was well expressed by one of the companies in its annual report. Says the report: "Appreciating the urgency of the demand and being eager to co-operate in any way whereby the war might be successfully prosecuted, the company and its affiliated companies placed at the disposal of the Government their entire

operating forces and engineering staffs, their plants and their product, that the demand for toluol might be met; the agreement between the Government and the companies providing that the companies, under the direction of the Government, should operate, *at cost*, the recovery plant to be constructed by the Government." In addition to this indispensable element in the manufacture of high explosives, furnished in large quantity by the gas companies of the country, substantially all of the carbon which was used for the gas defense of the United States forces and for a considerable portion of the Allied forces, was produced at one company's plants. In support of the Government loans, in participation in relief measures, and in innumerable other ways, locally and nationally, the industry played its great part.

Says the president of another company, in response to an inquiry from the Association:

"From the highest to the lowest the rank and file have met the situation with zeal and determination to do their bit. * * * My personal feeling is one of gratification that this company and its employees have met with enthusiasm every call that has been made upon them which would directly or indirectly lead to the paramount purpose, the winning of the war."

In the many commendatory letters received by companies from various departments of the Government, we find such expressions as these:

"The things you have accomplished are only possible with 100 per cent. enthusiastic support from every employee, and of this very worthy accomplishment, which in the last analysis means more shells for the boys in France, you may all be justly proud."

* * * *

"The value of the work being carried on at the ..... plant of your concern is of such importance to the conduct of the war that I am personally thanking you for your co-operation."

One company reports that 1,500 of its employees entered the service of the United States during the war; another 1,146; another 1,072; another 637. Still another reports that out of a total of 50 employees 16 went into the service.

And as they return to us they are welcomed back to the places they left. Their influence will be a vitalizing force in our industry, and hallowed for all time will be the memory of those others from our ranks who made the great sacrifice.

The whole record is typical. It was so throughout the land, in all lines of business. And everywhere the work of the women of the country, whose loyal and devoted service alone made it possible to keep domestic production up to war-time necessities, deserves the most generous recognition. How creditable it is to American business and how gratifying it is that our industry, helpful and patriotic in every previous emergency in its history, should have met this supreme test so finely and so completely!

Now as to the Association. Its work is rapidly nearing complete organization. For the first few months as much was done toward that end as was possible with so many of our men in the service and with restrictions put upon our activities by the imperative requirements of the Government. The foundation was laid, however, and upon that we have built. Since the signing of the Armistice the men have been returning, restrictions have been lifted, and the Association is assuming more and more the duties which you have expected of it. Its sections and committees are busy; its literature is reaching you in greater volume and substance; its relations with other organizations are being thoroughly established. Its Executive Board and officials are devoting time and energy to its affairs, and I feel I am justified in assuring you that the work you entrusted

to them is having their earnest thought and attention.

It is the weakness of many associations that they appear to lay the emphasis upon the multitude of their activities, with an accompanying large expenditure of money, rather than upon concrete accomplishments. It is all important that this Association should do a few things well, rather than attempt too much and do it all indifferently. But we must have a wide-awake organization, appealing to the interest and enthusiasm of the entire membership. Open and frank discussions in our meetings; thorough co-operation between sections and committees and the membership generally; and animating all our activities the spirit that was revealed "over there" in the historic remark of a French to an American officer: "Your men are trained to go in only one direction, and that is forward."

At the present time, the membership consists of—

Holding companies	10
Gas companies	278
Manufacturer companies	102
Individual members (active)...	1,406

The gas company membership represents approximately 60 per cent. of the total volume of gas business done in the United States. An active campaign is under way to enlist the co-operation and support of every gas company and manufacturer of gas appliance, equipment and supplies in the country, in order to make the Association a truly national one and 100 per cent. representative of the industry.

And the Association is more than national in scope. Our Canadian brothers are members, and as its influence grows others will join us, to share in the great advantages that come from union in a common interest and a common cause.

Of the work of the sections, I need not speak at length. You are, at least in a measure, familiar with it. As new needs present themselves new sections can be formed. The Association must never become hide bound to any immutable program. It must be flexible to be useful. It must be receptive to new ideas. It must reach the least as well as the greatest of companies, co-operating with all, impartially, and lending its facilities at all points to the individual striving for advancement, for in the help and encouragement it affords the employee, especially if he or she be among the younger and less conspicuous, it is building for the future of the industry and the progress and contentment of its entire personnel.

Each section should develop into a great national organization, allied to the central body by those provisions of our constitution and by-laws essential to successful unified effort. The sections are planned on that basis. The responsibility for accomplishment should be eagerly accepted by them, and under the guidance of the Executive Board the results should be of a gratifying and lasting character.

Gas should not yield the field to any rival. It should contest in the open for business and should encourage inventive genius and chemical and engineering research by every means within its power. In that way only can the rich field of possibility be fully cultivated. Reference to a few of the subjects that the sections are studying will show you that the Association is alive to the present and future needs of the industry.

As further indicative of the steps that have already been taken to perfect the organization, the general and sectional committees appointed and now actively engaged are—

General committees	15
Commercial Section committees..	7
Technical Section committees.....	8
Manufacturers Section committees	3
Accounting Section committees...	3

Our means of contact with the Federal Government at Washington, on the larger aspects of the situation created by the war, were the two important bodies, The National Committee on Gas and Electric Service (Mr. John W. Lieb, Chairman), and the National Committee on Public Utility Conditions (Mr. Philip H. Gadsden, Chairman); the former committee acting for the utilities in placing their resources and facilities at the disposal of the Government, the latter representing and safeguarding their financial interests. These two National Committees discharged their duties in a conspicuously able manner.

In conformity with the policy of establishing close relations with State and district gas associations, an affiliation agreement has been drafted which will be submitted to each of these associations for ratification. The New England Association of Gas Engineers has already voted to affiliate with us. The Association will have a representative in attendance at the annual meetings of all State and district associations, whether they are affiliated with us or not. Special committees have been appointed for our representation in the Chamber of Commerce of the United States and at the annual convention of the National Association of Railway and Utility Commissioners. In this way we are prepared to keep in contact with the large national problems in which we are interested.

The vitally important question of rates, and intimately connected with it that of the cost of materials—oil, coal and others; the ever mounting burden of taxation; and our relations with all forms of skilled and unskilled labor—these to-day stand out from among the many problems confronting the utility manager. We must by sane and helpful discussion and action assist him to a wise solution.

In many instances it is partly our own fault if the public misunderstands us. A utility company often adds to its embarrassment by allowing itself to be jockeyed into a position of unpopularity, due to the exigencies of local politics or other similar influences. The utility is an integral part of the business life of a community, contributing largely to its development and prosperity, though in the return on its investment it receives but a fraction of that of many other business enterprises. Its executives and employees are citizens, tax payers and voters, and they should play their proper part in public affairs. In their relations with consumers, they should deal with every complaint so as to make it, if possible, a source of future good will. Some philosopher has said that—"Good will, like a good name, is got by many actions and lost by one." Eternal vigilance in efficient service, therefore, is the price of public confidence. In their relations with other companies, they should remember that no company lives unto itself alone; that each holds in its keeping to an appreciable degree the welfare and good name of the entire industry, and in contemplating any given line of action, especially if it involves a radical change of policy, they should give due consideration to its effect upon the interests of the industry as a whole. Having faithfully discharged their duties to themselves, their associates and the public, then if their business is attacked they should pursue the same course that any other business concern would pursue—go to the people with the facts. If the public is fully informed and if their case is a just one they should not suffer in the outcome.

Having this thought in mind, the value of bringing before the reading public many interesting and useful facts regarding the industry should not be overlooked

or underestimated. In the Association we have the medium whereby a broad, sound and conservatively managed publicity work may be undertaken, without the necessity of spending large sums of money. With a properly organized advertising section or committee, a wide range of publicity is open to us. The preparation for the daily press, technical papers and magazines of articles of an inspirational and educational character, supplemented by assistance to individual companies in the actual planning of local newspaper and other advertising, would lead the way to a better understanding by the public at large of the service rendered by the companies.

The various gas trade journals have also a field of large usefulness to the industry which they should be encouraged to develop. The Association is desirous of co-operating with them to the fullest extent. Its headquarters office sends regularly to a list of these journals news items and copy for publication and will continue to do everything possible to secure their recognition as mediums for the publication of accurate and timely information. It is gratifying to note the spirit of co-operation evidenced by these papers and a continuance and further extension of this spirit will be helpful. We on our side can profit by their fair criticism and independent judgment.

I believe that the greatest achievements of the gas industry are ahead of it—through more scientific standards and a better application of them, through the development of new fields for its products, through united efforts to secure and retain public confidence, to maintain the stability of its investments and safeguard the interests of its security holders. Standards, research, utilization, conservation, commercial practice, valuation, rates, public relations in all their aspects —all call for our best thought and effort.

And so my appeal to-day is for renewed energy and enterprise; for the pioneer spirit in research; for engineering efficiency in plants and workshops; for frankness and courtesy and progressiveness in commercial departments; for study of accounting methods, to the end, among others, that the Commissions and other public bodies that regulate our business may recognize the waste involved in many unnecessary requirements, and in all the paraphernalia of the pigeon-hole; for co-operation with the manufacturers of our appliances and those who furnish our supplies; for a publicity that will properly represent us before the public; and, finally, for such relations with our employees as will recognize the new industrial order, in which a chief feature will be the conservation of the human element.

The war has taught us many lessons. One of them is that success in great undertakings depends not upon the efforts of a few, however strong these may be, but upon the co-operation of the many whose combined strength far exceeds that of any small, though relatively powerful group. So in our own industry, every member must do his part if we are to measure up to the opportunities that invite and challenge our best endeavors; but if all work together for the things that serve the general good there is practically no limit to what may be accomplished.

Who can measure the progress of the gas industry in the next decade if vision and foresight shall be characteristic of its leaders of to-day?

Honor Roll Notes

J. M. Morehead, reported in our January list as a member of the Chemical and Explosive Division of the War Industries Board, was a Major on the General Staff, in Washington, and we are pleased to note this fact for the correction of our roll.

American Gas Association Conference---Record Attendance

THE first Conference of the American Gas Association, held in New York City at the Hotel Astor, on March 13-14, went beyond the most hopeful expectations of its initiators, in both attendance and enthusiasm. During the two days of proceedings a total of 237 individuals registered. A count of the numbers actually present, however, showed an attendance easily exceeding the 250 mark. Of those registered, 151 were individual members, representing American Gas Association Committees and special activities; 45 were certified delegates of company members; and 41 were special guests or visitors. The complete list of names and of companies represented will be printed in the next issue of the MONTHLY.

The program itself called for papers and discussions of topics of immediate importance and the speakers showed themselves in remarkable touch with the spirit of the Conference by the way in which their queries and suggestions all conformed to the main question of policies and practices for use now, in this after-war period of readjustment and renewed growth.

The high points of the Conference stand out in the address of George B. Cortelyou, President of the Association, and the Honorable William C. Redfield, U. S. Secretary of Commerce. The time and place of convening had proved especially propitious and in addition to the address of the Secretary of Commerce, the Association had the pleasure and profit of listening to Mr. Mangus W. Alexander describe the aims and work of the National Industrial Conference Board, of which he is Managing Director.

Under the management of the Assistant Secretary-Manager, Mr. Louis Stotz, and the chairmanship of the President, Mr. George B. Cortelyou, the Conference proceeded smoothly and at high intensity to an enthusiastic close at one o'clock on Friday. Closing remarks were made by Mr. Albert M. Barnes, newly elected President of the New England Association of Gas Engineers, the first of the societies affiliated with the American Gas Association; Mr. W. H. Gartley, Vice-Chairman of the National Committee on Gas and Electric Service; Mr. Walton Clark, President of the Franklin Institute of Philadelphia, and Mr. Arthur Hewitt, of the Canadian Gas Association, Toronto. The two notes recurring throughout the Conference, in addresses, papers and discussions, were "service" and "immediate resumption of activity."

As planned the Conference was divided into two sessions, Executive and General.

Special Executive Session

President Cortelyou called the special Executive Session to order at 10 o'clock on Thursday morning and announced that only company members, through their delegates, had the privilege of the floor and the right to vote.

The by-laws of the Association call upon the annual Executive Session to elect by ballot a committee of six representative members to nominate the officers and directors of the Association

who shall be voted upon at the next annual General Session.

The President explained that in view of the fact that the first annual Executive Session would not convene until October, 1919, when a slate of officers would be needed immediately, this special General Session was called upon to elect a nominating committee at once. To facilitate matters the Executive Board offered, as a suggestion only, the names of six men for the Nominating Committee:

Chas. A. Munroe, Peoples Gas Light & Coke Co., Chicago, Ill.
Albert M. Barnes, Cambridge Gas Light Co., Cambridge, Mass.
L. R. Dutton, Philadelphia Suburban Gas & Electric Co., Jenkintown, Pa.
Carl H. Graf, Municipal Gas Co., Albany, N. Y.
George D. Roper, Eclipse Gas Stove Co., Rockford, Ill.
John A. Mason, The Bartlett-Hayward Co., Baltimore, Md.

Upon motion made and duly seconded, the names suggested by the Executive Board were accepted and unanimously elected as a Nominating Committee.

There being no further business for the special Executive Session, the meeting was declared adjourned.

Special General Session

The President then called to order a special General Session, at which all members of the American Gas Association were entitled to the vote and the privileges of the floor.

In due form and order, the following resolution for the incorporation of the Association under the laws of New York State was then presented and unanimously approved, together with a motion that the officers be authorized to proceed at once to have the Association incorporated, pursuant to the petition.

WHEREAS, The AMERICAN GAS ASSOCIATION is an unincorporated association, and

WHEREAS, It is deemed desirable for the best interests of the Association to incorporate it in accordance with the laws of the State of New York:

Resolved, Therefore, that the directors of the AMERICAN GAS ASSOCIATION be and hereby are authorized and directed to incorporate the said Association with the corporate name of AMERICAN GAS ASSOCIATION, pursuant to the rules and provisions of the Membership Corporations Law of the State of New York, and that the directors be and hereby are authorized and directed to execute and file proper certificates and to institute and carry out any and all proceedings that may be necessary to effectuate such incorporation.

At this point the President addressed to the members and delegates a formal speech of welcome in which he struck the keynotes of the Conference—a trumpet call to our industry—"to shake off whatever of timidity or inertia it has developed during its century of life—to become in the best sense militant, with its house in order, its ranks formed, its face to the front, and its aim and ideal—service, the greatest possible service at the least cost consistent with sound business practice." (See page 99.) Every gas man should be proud of the war record of the individuals and companies of the industry, as set forth by Mr. Cortelyou in his address.

Future Sales Policies

Mr. James P. Hanlan, Public Service Gas Company of New Jersey, Chairman of the Sales Development Committee of the American Gas Association, next presented a paper entitled "The Future Sales Policies of the Gas Industry and Their Justification." (See April issue for full text.) Mr. Hanlan's conclusions were drawn from data secured by sending out a questionnaire to gas company members of the Association. Efforts to obtain new business were general and aggressive during 1917 until the load added to gas lines by the unusually severe winter and the war demands

began to overtax the producing capacity of some plants. There followed a curtailment of sales efforts which extended well into or through 1918. Much good 1918 business was lost, Mr. Hanlan maintained, because gas companies had disbanded their trained sales departments. The new business department is an essential factor in the success of the gas company, as are correct prices, proper co-operation with appliance manufacturers, maintenance and all-year selling. Mr. Hanlan concluded that "we must go forward, not backward. The best men, the best methods and the best merchandise should be our motto."

Mr. Hanlan asked the co-operation of all members with the chairmen of the following sub-committees of the Sales Development Committees:

Co-operation with Manufacturers—H. W. Hunter, Baltimore, Md.

Determining New Business Costs and Sales Prices on Appliances and Job Work—A. P. Post, Philadelphia, Pa.

Selection, Training and Compensation of Sales Representatives—H. S. Christman, Philadelphia, Pa.

Ways and Means for Eliminating Valley Periods in Gas and Merchandise Sales—Wm. Gould, Boston, Mass.

Appliance Maintenance—J. C. D. Clark, Boston, Mass.

Sales Campaigns—H. K. Dodson, Baltimore, Md.

Policy of Sales Departments—J. G. Learned, Chicago, Ill.

Following Mr. Hanlan's paper, a serious discussion brought out clearly the conviction that the future policy of gas companies should be one of active selling effort. Mr. G. M. Karshner, New York, insisted that any sales success, however, that left service behind it, was a temporary success only. When service fails or the gas companies' prices, built to cover service, get too high, the public buys cheap and unreliable appliances which in a short time are back "on the gas companies' shoulders."

Mr. H. W. Hunter of Baltimore illustrated the reaction of cheap, untrustworthy merchandise on the gas company, whether sold by it or not, by citing the case of Washington in Colonel Roosevelt's day. After several asphyxiations, due to unfit appliances sold by various dealers, the authorities called upon the gas company to produce a gas which would not cause such disastrous results. It cost the company much money, before a commission was finally appointed to examine and pass on all appliances sold in the district.

Mr. H. K. Dodson, of Baltimore, speaking from the viewpoint of the sales department, believed that the gas company did not yet fully appreciate the work of that department. A sales department sells not only an appliance, but also gas. Hence, the new business man should not hear so much of a profit on each piece of merchandise sold and he should talk more of the service which increases sales of both appliances and gas.

Mr. Edmund S. Dickey took up the discussion from the point of view of the manufacturer. Once more the necessity of "service"—that is, a "service" which supplies the best in appliances and keeps them in the best of running order both by maintenance and by the quality of gas turned into them—was emphasized. Mr. Dickey declared: "In the A, B, C of business, the real profit is in service. You install an appliance to sell gas and, furthermore, you expect it to lead to the sale of another appliance to sell more gas. Unless the manufacturer is encouraged to supply a good appliance, the gas company pays extra thousands to maintain proper service." Mr. Dickey traced, through the American Gas Light Association, the gradual growth of the commercial idea until commercial men formed their own society. Scarcely was

this done when it was recognized that the National Commercial Gas Association should have a definite relation with manufacturers and a Manufacturers Section was formed. That growth was healthy because it was fundamental.

Mr. R. B. Brown, of Milwaukee, made the point that in his company all employees and officers must necessarily be "new business men," since all are working for the increase of gas business. Mr. Brown believes that the maintenance work carried out by his company is the biggest thing it has.

Mr. Chas. A. Munroe, of Chicago, gave a new turn to the discussion when he pointedly asked, concerning the future policy of the commercial department, whether it was good business to invite and accept as a consumer, one whose total monthly or yearly use of gas is so small that it fails to yield a profit to the company. Mr. Munroe's own answer was "No." The commercial department will do well not to load up the gas company with small customers who must be carried at a loss and are often more exacting than the big consumer.

As this note recurred in the discussion, the point was made that public utilities face the obligation to supply gas to consumers already on the mains or within a reasonable distance from them (mentioned as 100 feet or less), but it was claimed that the gas company is under no obligation to make long extensions to unprofitable communities, or to go after the business of small consumers on an aggressive policy. Furthermore, the "profit" on such consumers and extensions must sometimes be considered in terms of the satisfaction of voters and as a bulwark against the substitution of other methods for private ownership.

Mr. Dickey emphatically agreed with Mr. Munroe's point and expressed it as his opinion that the gas company should give very careful attention to the analysis of a new territory before agreeing to run its mains for supplying gas. There should be a profit on the service which is to be carried on any new extension. Reaching the saturation point on lines which already exist is an important consideration.

Mr. J. D. von Maur, of St. Louis, threw out as a caution, the suggestion that a large part of the increase in new business of the past decade has been brought in by a decrease in the selling price of gas; with no further decrease, a new problem is put up to the commercial department.

Referring to losses on the small consumer, Mr. W. H. Rogers, of Paterson, maintained that the classification of prospects as "loss" or "gain" must depend, not on the prospect's present, but the prospect's future. The commercial department can, in other words, turn a large per cent. of the unprofitable consumers into profitable ones, provided it remembers the full extent of its responsibilities.

It was the opinion of Mr. Mabon P. Roper, of Illinois, that a word of warning might well be uttered against an accounting system that handicaps the commercial department by charging to it too much overhead expense, while it fails to give credit for such valuable returns as are represented by the good will of families and towns that appreciate good appliances and service.

"The ideal sales department is one that produces the greatest amount of annual business with the smallest mechanism" is Mr. Walton Forstall's definition of true sales efficiency; that is, he demands a long-hour business every day in the year.

Toronto claims an uninterrupted service of 47 years and Mr. Arthur Hewitt pointed out the force of the argument

in persuading a city council that the gas company had a right to ask for a just return on mains laid. With 50 per cent. of all customers of the non-profit paying class, Mr. Hewitt felt justified in demanding that no increase be added to the unproductive load. He declared that each consumer should "pay his own way."

Of interest to gas men is one plan adopted by the Toronto Company during the war-time, when no appreciable extensions were being added to the lines. Where the value of land would be increased from $2,000 to $10,000 by having gas service, the real estate company was asked to pay 30¢ for one side of the road or 50¢ for two sides, for the installation of the main. This represented only one-half of the difference between present and normal costs for laying pipes.

Mr. Frank W. Frueauff, of New York City, director of numerous companies, asserted it as his experience that commercial departments can be made self-supporting. However, the test is not profit on commercial work, but the improvement of load factors. The commercial man should be asked to sell goods, not for the profit on the appliance, but for the increased consumption of gas, and with a view to a longer hour load.

Chicago, said Mr. O. T. Knight, has been content to conduct its commercial department on a "break-even" basis, while recognizing as its problem the bringing of each customer up to the point where he yields a profit. To do this the commercial man has been taught to put his energy behind the appliances where one sale brings the consumer up to the desired point. Furthermore, to push the sale of ranges, which already have a recognized demand, to the neglect of such "unsold" appliances as water heaters, is not good business. Chicago has had success in putting special salesmen on the street, men trained and concentrating on one article only. Such a plan tends to reduce to a minimum the installation of appliances unsuited to the customers' demands or badly set up.

The electrical industry is evidence of the fact that the co-operation of plumbers and general dealers depends upon the possibility of putting appliances on the market at a profit, and the gas companies need that co-operation for the sale of reliable gas merchandise only.

Mr. J. B. Klumpp was of the opinion that one subject which, to a large extent, governs sales, had not yet been introduced. Unless rates are adjusted to meet all conditions, we cannot sell gas in quantities. The consumer who uses so little gas that he does not pay the cost of supplying him, should pay a service charge. Mr. Klumpp stood in favor of a service charge, a demand charge, and a commodity charge, so that small consumers pay their own costs when their consumption is small, while if they work on the same load factor as the larger consumer, they get the gas at the same proportional rate.

It might be an excellent thing for the Association to prepare a report to help its members in the adopting of a proper charge basis. Mr. Munroe at this point jumped to his feet to express his pleasure over the fact that favorable expressions for service and demand charges are no longer considered heresies.

Mr. Carlton Geist, of Atlantic City, also approved of the service charge as a step in the right direction. The commission recently granted to Atlantic City a sur-charge of 25¢ and a service charge of 25¢ on 3 and 5-light meters (one cent additional for each light). The gas company had represented that the price which must be charged on a straight M. c. f.

basis to meet fixed and operating expenses could be reduced provided a service charge were permitted. The real service charge in Atlantic City should be nearer $1.00 and a charge of $1.00 would reduce the basic price of gas by 30¢. It is of interest to note that, while the sur-charge occasioned no objections, the service charge was disapproved by some 90 per cent. of the consumers, but the point can be put across, and the fight won to the ultimate benefit of both large and small consumer. Both the public and the Public Service Commission need education on this point. Furthermore, Mr. Geist does not believe it will be necessary for us to return to the former low prices on appliances. "Sell the best we can obtain."

Mr. Henry L. Doherty added a word to encourage the younger members of the Association in their efforts to bring about a revision of the rate basis. "We have got to come to the service charge. We have got to have a customer charge and a demand charge, which must come from the whole of the industry." Mr. Doherty himself read a paper on the subject in 1900 before the N. E. L. A., but four or six years work convinced him that the time had not then arrived for the change. Dr. John Hopkinson, in 1892, considered the subject in a presidential address which now, after this quarter century can well be brought to light again. Indications are that the time is ripe for this new policy of rates.

Committee on President's Address

Mr. Chas. L. Holman, Vice-President of the American Gas Association, in the chair at this time, appointed, with the approval of the assembly, a committee consisting of Mr. Arthur Hewitt, Mr. H. L. Doherty and Mr. Walton Clark, to receive and consider the President's Address, with the view to making a report thereon.

Second Session

This committee, at the opening of the afternoon session, presented the following resolution which was unanimously approved:

RESOLUTION.

The members of the American Gas Association in Special General Session assembled have heard with keen appreciation, pleasure and edification the address of the President, Mr. George B. Cortelyou.

Having in mind the high ideals expressed, the clear and concise statement of the aims, objectives and opportunities of the Association, the optimistic outlook as to the future of the gas industry; and to the end that the inspiring effect of the address may be extended as widely as possible, be it

Resolved, That the President's address be duly recorded in the minutes of the proceedings and that it also be printed in separate pamphlet form and be forwarded to each member of the American Gas Association.

(Signed) ARTHUR HEWITT,
HENRY L. DOHERTY,
WALTON CLARK.

President Cortelyou resumed the chair and introduced the Secretary of Commerce, Honorable William C. Redfield, whose remarks re-echoed once again the sentiments which the Conference had been trying to put into words—more service, better service and broader service for everybody—that is, the interests of the whole community kept in mind and handled sanely and sincerely. "The hope of a Republic is intelligent leadership—and not simply discipline imposed from above." (See April MONTHLY.) Enthusiastic applause and a spontaneous rising vote of thanks followed Mr. Redfield's remarks.

Mr. Magnus W. Alexander, Managing Director of the National Industrial Conference Board, the meeting of which accounted for Mr. Redfield's presence at the Hotel Astor, was then invited to address the gas men. Mr. Alexander is also consulting engineer of the General Electric Company. Mr. Alexander presented the

National Industrial Conference Board as an organization which for two and one-half years has been attempting to bring American industry and its problems before the public, Congress and Governmental Departments with a force additional to that exerted by such associations as our own, whose first interest is in the special problems of a particular craft or industry. This Board stands as an attempt to co-ordinate activities on questions affecting them all and at present it represents twenty-one powerful national industries. Monthly meetings are held to consider what can be done by honest and upright men to advance American prosperity at home and abroad. The Board has found that facts are the strongest argument with which to arouse or influence legislative and other governmental bodies and, therefore, definite research forms a large part of the Board's work. Given the facts, the necessary reform can come through the employer, the employee, the public, or the law. The conclusion is not predetermined. Sixteen reports have been issued. A study of the legal aspect of workmen's compensation laws showed only two States with the same law, and their interpretations differ. The question of the proper length of the working day is being considered from the point of view of each particular job. Furthermore, we need an accepted definition of the term "8-hour day."

The experiences of Australia, Canada and France in adjusting strikes and lockouts are under consideration. In America 3,000 strikes occurred in six months. In a limited period, 1,156 strikes lost us 6,385,000 hours of production. In England, in the same period, which covered the great coal strike, 2,100,000 hours were lost and American governmental figures showed for Germany a whole year's loss of 245,000 hours. The employment of women, and war-time changes in cost of living are receiving attention. Two reports bring our first hand information up to the Armistice and a new one will cover the period to March 1. Wage rates and weekly earnings for the war period and since have been compiled.

A trained commission of five manufacturers and a staff of trained industrial experts have just been sent to Europe by the Board, to investigate actual conditions and activities in offices, factories, mines, etc. The message to Europe has been, "In asking you a question, we are prepared to give you the same information with respect to our own industries."

At the close of Mr. Alexander's remarks, Mr. J. B. Klumpp, of the Technical Section, took the chair and opened the discussion with a short address.

Technical Subjects Discussed

Mr. Klumpp briefly outlined the problems which the utilities have been facing in the mounting costs of operation and prices of raw materials, combined with the delays incident to securing much needed rate increases. After expressing his belief that the Association would be able to assist its members in many phases of the situation by encouraging unity of thought and action in the solution of their problems, the Chairman spoke of the organization of the work of the Technical Section as follows:

"In preparing for the coming year, the Managing Committees of the Technical, Commercial, Manufacturers and Accounting Sections have been in close co-operation and the work laid out by the chairman of each section has been selected to dovetail, as far as possible, and at no times to conflict with, the work that is being carried on by other sections.

"In our new organization we intend that much of the work should be done through committees, with less dependence upon individual efforts and ideas. Where a subject falls under the jurisdiction of two or more sections, the committees formed have been

indicated as joint committees or the personnel serving has been selected by chairmen of these sections in co-operation. We hope that thus there will be no duplication in effort and the subjects will be handled with the greatest efficiency and with a scope broad enough to include all phases applicable to the entire industry.

"In scanning the work of gas associations in the past, we find that many subjects were presented in papers prepared by individuals who gave to the Institute their own ideas through their personal experiences. Later, as the subjects became more complicated and were found incomplete unless the ideas of several men entered into their exposition, committees were formed to collaborate and present reports more generally and completely treated. Through committee work, I believe, we are better able to thrash out subjects and get down to their essential facts with a general balanced expression of opinion, and thus present the matter to the Association in a manner that will be useful to the membership at large.

"Having this point in mind, we have endeavored to shape the activities of our section along lines that will permit many committee reports to be submitted at our next Fall convention. In doing this, we do not want to throttle individual initiative, but we hope to put those who have this initiative on the committees and, where possible, as chairmen of the committees, so that when a subject is presented to the Association it will have the combined initiative of several enthusiastic members.

"We are now asking for your co-operation. We are selecting committees to report on many subjects of extreme importance, on the careful solution of which much depends. It is difficult at times to find the right men—some have refused to serve, owing to lack of time or to its strenuous expenditure in overcoming their own difficulties. Well-executed committee work is always an educator for each committeeman and he is not only benefiting the Association and its members, but he is getting information that will accrue greatly to his own advantage. It has, moreover, been difficult to select the personnel of our committees, because we are not acquainted with the special activities of many of our members, particularly our younger men, and many of the older workers of the Association are voluntarily undertaking too much. Where our members are interested in the solution of any particular problem and have information that can be of value to the Association, I do hope that they will communicate with the Secretary of the Technical Section, Mr. H. W. Hartman, or the chairman of the committee concerned and express their desire to assist us.

"This Association has affiliated with it, or expects to have affiliated with it, many state and geographical associations which have their own organizations, committees, and individuals working on situations that are distinctly pertinent to their own problems and it is essentially the duty of this Association to co-operate and assist where it is possible for us to do so. I have more particularly in mind the investigation now taking place in Indiana where the State Commissioners have invited the Municipal League of that State, the Bureau of Standards and the Indiana Gas Association to co-operate in the investigation to determine what should be a reasonable specification to adopt as a calorific standard for the gas manufactured in that state and at the same time to pass upon a proposed set of "Gas Service Rules." This investigation has been under way for the past two months and will continue probably a month longer. It was started early last fall with the idea that the present standard could not be obtained under the prevailing war conditions. It is now, however, being promulgated with the idea of legislating for normal operating conditions, utilizing the fuels normally available. We can all appreciate that the results of the efforts of any one state will be anxiously awaited by other states, and it should be the desire of our national Association to co-operate and to assist our associates to obtain the true solution of the investigation.

"As to individual papers: At the annual meeting in the fall we expect to have some very important and interesting papers presented by individuals covering their investigations and ideas along certain lines and I am sure that these papers will not be overwhelmed by committee reports, since they deal with subjects that it would be difficult for committees to report upon.

"Many of our members have problems of their own to solve or which they have solved and these problems may be of great interest to the Association at large. We should like to have these called to our attention so that we may decide whether the facts justify their presentation, in the shape of a paper, to the Association."

Committees

The Chairman then enumerated the committees organized in the Technical Section and the work planned for each committee. The following progress reports, some of which, for lack of time, were not read at the Conference, indicate the status of the Section's work to date.

Electrolysis Committee

The electrolysis problem has been before the various gas associations and organizations having similar interests, for the past twenty years, and while some progress has been recorded, yet it cannot be said that satisfactory results have been obtained.

The managements of public utilities whose properties are being slowly destroyed, too frequently look upon the loss as an incident in the conducting of business; what they fail to appreciate is the fact that the effect of electrolysis is preventable and that this waste must, in the end, be paid for by the general public or, rather, by that particular class of the public whose interests the utility is permitted to serve.

The management of a public utility which permits the partial destruction of its property to continue, without effort to stop it or without making protest to the regulatory body under whose jurisdiction it operates can hardly be said to be performing its full duty to its patrons.

It would seem that the Public Service Commissions should see to it that such rules and regulations respecting the operation of street railways, are promulgated and enforced as would prevent damage which must in the end be paid for by those in whose interests the Public Service Commissions are supposed to exist.

The United States Government through its Bureau of Standards is carrying out the principle of conservation of resources when it lends its efforts to assist the solution of the electrolysis problem. The solution which it has suggested for different localities has been more or less satisfactory.

That the conditions are very serious in some localities is shown by the fact that in one large city a municipally owned water main, laid at a cost of nearly $300,000, was destroyed to such an extent that the whole main had to be shut down for investigation and repairs within 18 months after it was put into service.

In another city the water main on which the supply of the city depended was so badly corroded by electrolytic action that temporary repairs to the main cost over $100,000.

A gas company operating in a city of about 350,000 population has estimated the damage to its gas piping system as over $300,000 during the past five years.

The legal aspects of the case have, apparently, never been settled satisfactorily by the courts. In the judgment of the committee this phase of the problem should be studied. The American Gas Association may well seek the opinion of competent counsel in the matter. A favorable opinion might at least have the effect of producing more cordial co-operation on the part of street railway companies.

The Committee is charged with the duty of keeping in touch with electrolytic conditions throughout the country and of co-operating with similar committees which may be appointed by other organizations, and particularly of keeping in touch and co-operating with the Bureau of Standards in the work of finding a satisfactory solution for these troubles.

At the time the Committee was appointed the Bureau of Standards was about ready to print a revision of Technological Paper No. 52, which was sup-

posed to represent the Bureau's latest attitude on the subject of electrolysis, in which the attitude toward pipe drainage was more favorable than had been taken in the past. Your Committee felt that pipe drainage which would necessitate the installation of electrical connections between the piping system and the railway system, should not be countenanced as long as it was practical for the street railway company to take care of its currents by other means. A conference with the Bureau, held at Washington on October 17, 1918, resulted in the report being somewhat modified with respect to this phase of the problem.

An account of the co-operation of your Committee with the American Committee on Electrolysis will be found on page 61 of the February issue of the MONTHLY.

An attempt was recently made, by a company located in one of the middle western states, to have the Public Service Commission prescribe rules for the operation of street railways which would protect underground structures from the electrolytic damage caused by stray currents. The street railway company brought up the question as to whether the Commission had jurisdiction in the matter. This phase of the problem is now under consideration. The Public Service Commission in another State decided that it had jurisdiction in electrolysis cases involving public utilities. Also, in Wisconsin, the Public Service Commission issued an order in the Beloit Electrolysis Case, limiting the voltage drop in the grounded rail return.

Recently an investigation was made of the electrolysis conditions existing in Milwaukee. The question was brought to the attention of the Public Service Commission by the city, on account of alleged damage to its water piping system, caused by stray currents from the street railway tracks. After a conference of the various interests involved, a survey was made by the representatives of the Bureau of Standards. The street railway company of Milwaukee has improved conditions considerably during recent years by installing a partial system of insulated return feeders, and by operating the three-wire system in one district for a portion of the day.

Your Committee, however, does not feel that conditions in Milwaukee have been as satisfactory as the report of the Bureau of Standards would seem to indicate, and it will probably request the Bureau of Standards to clear up some of the statements in the report before it is printed. But little can be done by the Committee without the support of the company members of the American Gas Association.

Damage from electrolysis constitutes a waste that must be stopped. It also brings about a dangerous condition that should be eliminated.

There is now a country-wide desire for the improvement of city streets on a large scale, with expensive pavements. This, with the ever-increasing cost of labor and materials, will make the expense of main and service repairs higher and higher; and we must, therefore, have a higher degree of protection than was formerly thought necessary. The ever-increasing complication of underground structures also makes it necessary that the remedies adopted should not be such as will complicate conditions still further. It is not fair that an element of danger be injected into the distribution of the gas supply simply to relieve another utility of its inherent responsibility to prevent current from straying from its rails.

Your Committee requests that company members assist it by bringing to its

attention any information that may have a bearing on its task. To those who are interested in both gas and railway utilities, the Committee appeals particularly for co-operation. A selfish stand in this matter will not in the long run mean a gain to either interest. The Committee does not intend to wave a red flag or create undue agitation. It is minded to co-operate with those who are willing to co-operate with it, to meet in conference with those willing to confer, and to assist in collecting information that may help us to find the best methods of bringing this perplexing problem to a successful solution.

J. D. VON MAUR, *Chairman*,
Laclede Gas Light Co.,
St. Louis, Mo.

Committee on Cast Iron Pipe Joints

This Committee was appointed to continue, and if possible, to finish the work begun in and carried on since 1915.

Briefly, the investigations and collections of data have indicated that cement joints in standard bells are being used, with entire satisfaction (leakage percentage practically zero), in the smaller sizes of cast iron mains, by the majority of gas companies. Cement joints in standard bells are being used in the larger sizes of mains in a few locations where the history of such installations shows a satisfactory record. However, there are so many locations in which they have not proved satisfactory that engineers have largely stopped using them and have substituted cast lead, or lead wool, and yarn; or combination lead wool and cement or cast lead and cement. Both standard bells and special bells have been used in these combination joints. The reasons for the failure of some installations of large cement joints and the successful performance of others, are not clear. It is a fact, however, that the theoretical calculations based on reasonable assumptions and the exact data now available, indicate that the all-cement joint in large standard bells, is fundamentally weak.

The Committee fully realized the great value to the industry of a design of cement joint in large bells that would be certainly satisfactory. It was also apparent that the data available was unreliable. The first determination to be made was the actual strength of bond and shear of cement as used in joints. A series of laboratory experiments were undertaken with this end in view and have been satisfactorily completed. With this data, it would now be possible to design positive cement joints in mains of any size if the stresses to which the mains would be subjected were fully understood. Certain of these stresses are quite clear and can be calculated on the basis of entirely reasonable and sound assumptions. Other stresses, however, are decidely obscure and include so many variables that no method has as yet been worked out even to approximate them.

It is now obvious to the Committee that the standard bell must be modified in the larger sizes if the all-cement joint is to be designed. It is probable that a modification of the bell would improve the combination joint. At the time of the submission of this report of progress, the Committee has reached the point of studying the possible modification of the standard bell.

G. I. VINCENT, *Chairman*,
Syracuse Lighting Co.,
Syracuse, N. Y.

Chemical Committee

The Chemical Committee is now organized and has planned most of the work that it intends to do. This work will include a revision of the "Gas Chemists' Handbook." Each member has

been allotted a chapter or subject. He will receive communications from members of special committees and from other men interested in his subject and with the help of his assistants he will work on the revision of the methods of analyses. When ready, he will present his report to the Committee. The Committee as a whole will consider these reports and, when they are in proper shape, will appoint an Editorial Committee to put the matter in final form for a new Handbook.

Each member has also had assigned to him one or more journals, from whose pages he will abstract any papers of a chemical nature applicable to the gas industry. These abstracts will give the title, the author's name and the journal and will be published in the Association MONTHLY. In addition there will appear complete abstracts of the most important papers, which will be written in such a manner as to interest the lay members of the Association in the chemical aspects of our industry.

The Chemical Committee is ready to be of any assistance to other committees of the Association or to the members in furnishing help of a chemical nature.

The fundamental reason for the existence of the Chemical Committee is its effort to make known the value of the chemist to the gas industry. The various items of the Committee's work can only be regarded as details of this subject. We have two papers on the "Value of the Chemist to the Gas Industry," one of which has been read at the Conference but unfortunately time did not permit of its discussion. It is hoped that any member who has ideas on the subject will communicate with the Committee.

The Committee appeals to the members of the Association who are interested in chemical work to keep in touch with us, and submit any inquiries or suggestions to the Chairman. It especially appeals to the younger members. There have been many young men who have entered our industry through war work and we feel that they should keep up their interest. It is on the younger men that we have to rely and in making this appeal, the Committee trusts that interest will be stimulated and that the application of chemical knowledge and practice to the gas business will increase in importance as time goes on.

E. C. UHLIG, *Chairman*,
Brooklyn Union Gas Co.,
Brooklyn, N. Y.

Carbonization Committee

The Carbonization Committee of the American Gas Association met in the Association offices, United Engineering Building, on Thursday morning, March 13.

After open discussion by all members as to the proposed work of the Committee, it was unanimously resolved:

That each member of this Committee make a written report to the Chairman concerning any improvements in carbonization since the report of the last Carbonization Committee of the American Gas Institute, and also suggest subjects of unusual importance which should be followed up.

That this written report be mailed to the Chairman of the Committee before May 1, 1919.

That a committee consisting of chairman and two other operating members be appointed by the Chairman of the Carbonization Committee to prepare a report to the Association, for the Fall meeting of 1919, to make suggestions for the most important subjects to be further investigated, and to recommend to the proper committees any paper on these

subjects which should be prepared and presented to the Association.

That this committee of three send a copy of its report to the Association, to each member of the Carbonization Committee as soon as possible. That another meeting of the whole Carbonization Committee be held shortly after the report is first drafted.

JAMES A. BROWN, *Chairman*,
Hodenpyl, Hardy & Co.,
Jackson, Mich.

Consumers' Meters Committee

The Consumers' Meters Committee has been but recently organized and has had the opportunity to prepare but a brief report for the Conference. Following is an outline of the work to be covered this year:

1. Standard method of proof testing meters, including the complete handling of meters and the bringing of practice up to date.
2. Number of meter sizes that are necessary and what should be the capacity unit.
3. What experience has been had with a lubricant for valves that will prevent meters from sticking, especially when out of use for a period of time.
4. What is the cause of strained flag arms and the best remedy.
5. What inducement can we offer to encourage the training of meter repair men.
6. Why should we not use straight reading indexes similar to odometers?

If there are any other subjects that members of the Association wish to have included in the program, the Committee will be glad to give them consideration.

GEORGE WEHRLE, *Chairman*,
Niagara Light, Heat & Power Co..
Tonawanda, N. Y.

Refractory Materials Committee

With reference to the co-operative work of the U. S. Bureau of Standards, the Gas Refractories Committee of the Refractories Manufacturers Association and your Committee, your Committee would state that two reports have been prepared and presented at a special joint meeting of the committees.

The first of these reports was entitled, "The Porosity and Volume Changes of Clay Fire Bricks at Furnace Temperatures," by George A. Loomis. It covered the results of a large series of experiments that were made with a view to corelating the change in volume and porosity of fire clay refractories with the results of the "load test," previously reported, in an endeavor to develop a simplified test that would permit the rapid handling of a large number of samples. The results obtained were extremely interesting and indicated that this method could probably be used as an elimination test, but that it should not entirely supercede the "load test."

The second report, entitled, "Notes on Silica Refractories," by Donald W. Ross, consisted of a study of the physical characteristics of silica refractories as affected by variation in raw material, grinding, and burning. Among the features determined were changes in porosity, specific gravity, and microscopic composition.

Your Committee has been working in conjunction with Committee C-8, of the American Society for Testing Materials, and during the past two years a number of tests for determining the various physical characteristics of refractory materials have been developed. Among these may be mentioned, in addition to the load test, methods for the ultimate chemical analysis of refractory materials, a method for the determination of porosity and permanent volume changes, a test

for slagging action, which will probably prove of interest in connection with lining blocks for generators and producers, and (now under consideration with a possibility of a report during the coming year) a method for determining the softening point of fire clay brick, and definitions of clay refractories.

Committees are also actively engaged in work on a spauling test which will probably prove of interest in testing checker brick and on the measurement of thermo-conductivity, which should prove valuable in the design of recuperators and retorts.

In addition, your Committee expects to give active assistance to the Industrial Survey Committee of the American Society for Testing Materials, which has in progress a comprehensive survey of the service conditions under which refractories are used. And further, your Committee is working on the subject of Refractory Materials for Water Gas Plants.

H. L. UNDERHILL, *Chairman*,
The Bartlett Hayward Co.,
Baltimore, Md.

As not sufficient time was available at the Conference for discussion of these reports, members are requested to submit their comments on the committees' work to the Chairmen or to the Secretary of the Technical Section, 29 West 39th Street, New York, N. Y.

At the conclusion of his address, the Chairman touched briefly on the subjects which had been prepared for discussion by the meeting. The first subject, "Obtaining the Best Possible Operating Results with the Inferior Quality of Raw Materials Being Received" had been suggested by a number of members and while the quality of raw material is improving to some extent, the situation is not entirely normal and some companies are still facing a problem due to the large stock of inferior raw materials on hand. The high sulphur content of the gas coals received by many companies has necessitated improvement in purification methods and this has led to a discussion of liquid purification as a means for reducing the fixed sulphur.

In order to answer the often repeated question, "What Shall We Do with Our Light Oil Plants?" the Chemical Committee, through Mr. W. H. Fulweiler, compiled a symposium of views of gas companies, as to how these abnormalities which have grown up in our plants, because of the exigencies of war, can be utilized.

The Chairman then called on Mr. G. I. Vincent who presented a very interesting discussion on "Operating with Low Grade Manufacturing Materials," giving a description of the writer's experience with the present quality of anthracite coal, gas oil and bituminous coal for boiler fuel. This was followed with a brief description by Mr. C. O. Bond of tests conducted at coal gas plants in Indiana to determine whether the calorific standard should not be fixed below 600 B. t. u. with the fuels obtainable under present conditions.

In connection with the subject "Liquid Purification of Gas," Mr. O. B. Evans described an experiment carried on by one of the oil companies at Philadelphia, for the removal of hydrogen sulphide from high sulphur surplus still gases by liquid purification. Mr. W. H. Fulweiler added to this discussion a short description of a hot purification system tried out at the Harrisburg plant where the gas was heated to about 450° F. and then passed over very active iron oxide.

A summary of replies received to a questionnaire sent out by the Chemical Committee on the question "What Can be Done with Existing Light Oil Plants?"

was then read by Mr. W. H. Fulweiler and produced a lively discussion by Messrs. W. H. Earle, C. J. Ramsburg and D. W. Jayne of the Barrett Company.

Mr. R. B. Brown presented a very interesting paper on Milwaukee's experience in the "Disposal of Waste from Gas Plants," which was discussed from various angles by the meeting. Following the discussion of Mr. Brown's remarks, Mr. L. R. Dutton described a filtration system for waste water from a carbureted water gas plant, which had been successfully used in a plant producing 1,000,000 to 2,000,000 cubic feet of carbureted water gas per day.

The Chairman next called on Mr. W. F. Meston of the Research Corporation, who read a short dissertation on the "Use of Electricity in Dehydrating Tar." This subject is yet in an experimental stage, but it was considered worthy of discussion as a possible improvement on the present means for removing water from tar.

The afternoon session was concluded with a reading, by Mr. E. C. Uhlig, of views obtained from members of the Chemical Committee on "The Value of the Chemist to the Gas Industry." This matter will probably be the subject at the Fall meeting of a sub-committee report that will indicate the possibilities of the chemist in increasing general efficiency and net earnings of a gas property and will outline his proper sphere of action in the plant organization.

Third Session

At the morning session, on Friday, Mr. Klumpp took the Chair to receive the report of the Carbonization Committee and a brief outline from Mr. Walton Forstall, Chairman of the Committee on Cast Iron Pipe Standards. Mr. Forstall explained that he represented a standing committee whose purpose was to receive and consider suggestions for any changes in existing forms. All members interested in this subject should communicate with the Chairman of the Pipe Standards Committee.

Present Market Conditions

In presenting his paper entitled "An Analysis of the Present Market Conditions," Mr. Edmund S. Dickey (Baltimore) spoke in behalf of the Manufacturers Section of the American Gas Association.

Under the regulations of the Section there can be no exploitation of the products of individual manufacturers. The formal speakers of the Section must be considered as expressing the opinions of the Section as a whole, and every manufacturer realizes that the marketing of his product to the gas companies must be through the medium of an open market on a competitive basis.

Mr. Dickey's primary analysis showed the existence of three factors in the merchandising problem—the producer, the seller and the buyer—and of these, the selling agent is by no means an unessential factor or one easily eliminated. We have recognized its importance in the gas industry, and the work of the commercial man has increased until now it embraces also the ideas of maintenance and service.

Mr. Dickey divided merchandising into "Pre-War," "Wartime," and "Post War" methods. All of these require real selling ability and "a clear platform representing truth in advertising." Merchandising under war conditions reversed the relation of producer and buyer. For post-war conditions, we can well afford to say less of "reconstruction" and to act more on the principle of "go-ahead."

Prices on gas appliances are fixed by costs of material, which in turn depend upon costs of labor. The manufacturer

who intends to retain the business of a comparatively limited number of buyers, knows that he cannot charge exorbitant prices in a limited and competitive market. Hence, with prices based upon fundamental factors, we cannot look for a quick reduction if quality of goods is to be maintained. And on quality goods depends much of our success. We must use our best selling genius to go ahead at present prices. Mr. Dickey's illustrations showed that results can be accomplished. (See April MONTHLY for complete text.)

Mr. J. P. Hanlan opened the discussion on Mr. Dickey's paper by emphatically declaring that the message for this moment must be "go-ahead." The people have, at this time, a remarkable buying power, but any industry that hopes to profit by the fact must offer inducements for buying. As evidence of the sales that are awaiting the energies of the gas man are the one-family houses now sheltering two families; the crowding of a household into four rooms instead of eight, because of the falling off in normal building operations.

Mr. William Gould (Boston, Mass.) took Mr. Dickey's paper, point by point, and made comments as they occurred to him. He believed that the "open market on a competitive basis, for gas appliances" would improve the healthy condition of the merchandising departments of gas companies and, together with a substitution of active selling policies for old lax methods, would bring about an improvement in conditions for the whole industry. "Active Selling Methods" evidently include attention to the maintenance of appliances once sold and a development of the "art of getting the other fellow to buy something he needed but failed to recognize."

The merchandising departments of the gas company are faced, first of all, with the necessity of selling their own services to the company: the executives of the business will be under obligation to the sales department if the sales department really lives up to its name.

The manufacturer of gas appliances can fully appreciate the war-time reversal of the relative positions of producer and buyer, and now, with peace and the reconstruction period, we may well talk of a "new birth of confidence" —confidence in the accuracy of the meter, in the necessity of gas in the modern home or shop, confidence in the splendid service given by gas companies in conjunction with the appliance manufacturer.

The gas man should examine his tendency to fear the re-sale price of appliances. "We give the customer too much credit for his knowledge concerning our product and appliances, and too little credit for his ability to pay our prices. We have seen in other fields the fact that high prices are not an obstacle to sales where desire has been created and service is offered."

Mr. Gould took occasion at this point to call attention to a tendency among organizations to offer suggestions to the larger members, who stand in less need of help. It is oftenest the small unit, section, company, etc., that can make best use of suggestions and regulations submitted by an association; Mr. Gould hoped that the American Gas Association would keep this fact in mind.

As confirmation of Mr. Dickey's conclusions on the advisability of going ahead at once, Mr. Gould stated that the majority of companies in New England showed a falling off in their output of October, 1918, as compared with October, 1917, and this falling off has continued, as compared with the previous year, into January and February of 1919. The cause has been, the return of the

people to the burning of coal in ranges and water heaters—utilization which the gas salesman has not held in spite of all of the points in his favor. We need a slogan—"Twelve months' burning of gas appliances a year."

Mr. A. P. Post was interested in the questions of finance which Mr. Dickey's subject introduced and it was his opinion that on the slogan "Go-ahead" a fundamental difference exists between those industries whose production costs and selling prices were both affected by war conditions, and those industries that saw their materials and labor advancing, while selling prices were held at a fixed point by law. The gas companies bore a war shock that may justify them in going slowly now, especially if there is a chance that the present high standard of prices will drop. "The surplus and reserves of many gas companies were impaired—an important point of difference from the balance sheets of companies other than utilities. If capital is now obtainable and materials and labor available, are gas companies, in view of their war experience, in a financial position to go ahead?"

The discussion on Mr. Dickey's paper was brought to a close by Mr. O. T. Knight of Chicago. Mr. Knight wished to put himself on record as in favor of pushing supplies under present conditions even more strongly than three or four years ago. High prices on gas appliances are but in line with high prices on other goods, and proportionate to the higher purchasing power of the public. A canvass of architects and building contractors in Chicago revealed a surprising number of large building operations under way—and the gas company is going to advertise for that business.

Mr. Knight declared that once the commercial man has established his department on a "break-even" or "make-money" basis, he is able to secure from his management support for any proposal be may make.

Industrial Fuel Outlook

The next paper of the program was presented by Mr. W. A. Ehlers, of the American Gas Association Staff, on the subject of industrial fuel possibilities—a subject made pertinent to the gas industry by its effect upon the returns on capital invested, and on profitable future expansion of gas interests.

Mr. Ehlers made the point that the "gas company" of to-day may well develop into an activity whose purpose it shall be to supply to the community all of the fuel, either gaseous or solid, which the community may need. This state of affairs will come about as the company develops the by-product industry. The industrial load is much more valuable than the domestic load and when by-products constitute a profit, gas for industrial uses can be sold at a price that will meet all competitors. The manufacturer and factory manager think in terms of fixed charges and gas will appeal to them much more easily when it has established a fixed charge for service and readiness-to-serve, plus a rate charge for all gas supplied.

Mr. Ehlers emphasized the need for appliances properly constructed, and selected to do the work in hand, and intimated the value of a central testing or experimental laboratory for the development of apparatus to accomplish special tasks. (See April MONTHLY for complete text.)

To indicate the size of the possibilities which industrial gas men see about them, Mr. H. O. Loebell (New York) did not hesitate to talk in terms of million dollars. Intangible values in the use of gas can be capitalized for the small manufacturer so that he will buy gas fuel even at a high price. But when the appeal is

made to the big manufacturer, the low price factor must enter into calculations. Fuel oil and producer gas are the two fuels which compete most seriously with industrial gas. Oil just now is selling at as cheap a figure as can be expected, since oil is being used at a more rapid rate than it is being produced. Furthermore, fuel oil is a by-product, and as such, its selling price will fluctuate according to the prices of naphtha and crude oil. The development of the cracking process for the production of gasoline militates against the production of fuel oil and we may expect to see fuel oil removed from the market permanently. In that case, manufacturers who need a flexible fuel will use central station gas.

Mr. H. H. Clark (Chicago) called attention to the very favorable load factor created by industrial business. The family using gas for lighting and cooking produces a load factor of 12 per cent. For househeating, the load factor is zero for at least one-half of the year. An automatic water heater has a load factor of 4 per cent. and a storage system, 24 per cent. Industrial use of gas represents a load factor of 45 per cent. and in some cases, the figure approaches 100 per cent. Forty-five per cent. is the average, as against 7 per cent. for domestic customers.

Mr. Thomson King, of Baltimore, seconded Mr. Clark's estimate of the industrial business as the best business presented to gas companies to-day. It is the business which returns the largest percentage of profit per unit of gas sold, because it is the long-hour, the high-load-factor business. It is also possible to prove to the manufacturer that gas is the cheapest fuel for him, per unit of output. The healthy standard for the gas company is 50 per cent. of total output going to industrial users. This standard can be reached if fully trained gas salesmen are put to work. We must do our best to sell proper appliances and to encourage the demand for efficient service. Then there will be no practical limit to the business which the gas man can get.

Mr. F. F. Cauley, of Chicago, caught up Mr. Ehlers' point for the creation of better gas-burning appliances and urged the value of a central development laboratory. There is work for such an undertaking, from the development of a refractory material up to the completion of satisfactory industrial equipment. Mr. Cauley very much approved the suggestion that the Association, through Mr. Ehlers, issue, from time to time, bulletins giving actual cost data for the carrying on of experimental work in various lines.

Mr. R. W. Leslie, of the Surface Combustion Company, called attention to the fact that both France and England are working vigorously along the lines which Mr. Ehlers' paper suggests—the carbonizing of raw coal to produce every possible fuel or by-product unit for use. Raw coal is almost a forbidden fuel.

If gas depends upon coal, why should not a rate be fixed to fluctuate as the price of coal fluctuates? Mr. Leslie maintained that in some cases this idea had worked out successfully.

Further, if gas companies and manufacturers of gas appliances co-operate, the scientific apparatus for a job can be made to sell itself on the basis of the savings which it effects. Successful industrial gas appliances cannot be "ready-made," like clothing.

The emphasis in Mr. S. T. Willson's remarks was put upon the need for first-class industrial salesmen. The burden on the salesman is especially heavy, for he must know both the goods he represents, and the people he meets. A cheap

man may be trained to do good office work, but it takes a man of big caliber to meet prospects, sell goods and create good-will for the company he represents. The combination of good engineer and good salesman is one of the hardest to find.

Mr. Wilson strongly approved the idea of a central testing laboratory; he believed that extensions for prospects should be run according to the possible returns on the investment (1,000 feet for an industrial prospect, if 100 feet can be allowed for a domestic consumer); he argued from Mr. Cauley's statement that appliances are the instruments by which we sell our product, that the profit on an appliance sale should be calculated on the basis of total products sold. On such a basis, a commercial or industrial department can be made self-supporting.

British Manufacturer Speaks

At this point, the Chairman introduced Mr. E. Russell Brayshaw, a prominent British manufacturer of apparatus and appliances.

The burden of Mr. Brayshaw's remarks was the gas man's tendency to discount the industrial man's knowledge of his own requirements. A laboratory for testing and development would be in a position to work along side the user and meet his requirements in their entirety. Mr. Brayshaw cited two typical British installations where experimentation developed the proper appliance: the British Mint where all melting is accomplished by coal gas with a saving on labor, fuel and crucibles for one year of 29 to 30 per cent. as against coke; and the installation of twelve large furnaces (12 by 6 feet) in a Scotch factory for very accurate heating of steel, where women without previous experience are operating, with a temperature control maintained within 5° C. Other points than economy must also be considered.

The British have secured very good results by inviting experts on different subjects to assist their gas furnace standardization committees in working out models for general use.

Mr. G. M. Karshner, of New York, declared that he could not see another meeting of industrial gas men adjourn without making a plea for definite action on the suggestion for a central laboratory. It was Mr. Karshner's opinion that the time has arrived for carrying into effect the general sentiment in favor of subsidizing manufacturers under a central committee, or inaugurating a plan for a laboratory.

An Advertising Section

This subject was brought up on a petition signed by more than fifty members of the Association who pledged themselves to become members of the Section if it were formed.

Mr. Milt Saul read a paper setting forth the arguments in favor of a separate adverteising section for the American Gas Association. (See April MONTHLY.) He presented the need for modernizing the methods by which the public is to be made aware of the service which gas is prepared to supply. We need trained men to distribute technical information among a public which constitutes our prospective market, and the Association is carrying out its general function if it assists in the training of these men and the distribution of this information. The Advertising Section will be in the nature of a central publicity bureau for the gas industry of the United States. It will encourage the establishment and growth of advertising departments in the local gas companies. It will, moreover, keep in mind constantly the fact that in advertising, the gas industry is a single unit—every part of which must be affected by the activi-

ties of any one part. Naturally there will be a department for gas companies and another for appliance and apparatus manufacturers, but these two will also work in co-operation for the benefit of the whole.

Furthermore, the work of the Advertising Section will be best carried on by a paid secretary who will devote all of his time to the field. He will work with and through gas men in local fields and he will create a bureau which will be a source of good publicity and a help to the units of the industry, with no intention of becoming the only source of publicity in the field.

Following Mr. Saul's remarks, a vote was taken and declared overwhelmingly in favor of the formation of an Advertising Section.

Mr. Cortelyou at this point introduced Mr. Albert M. Barnes who made a very graceful speech to express his interest in the proceedings of the Conference. Mr. Barnes claimed for the New England Association of Gas Engineers the title of parent gas association in the United States, among whose offspring the American Gas Association could be counted. Mr. Barnes also quoted an interesting Massachusetts case wherein a small town company asked permission to increase the price of gas because of the high cost of material and labor. Twenty consumers at the same time petitioned for a reduction in price. The evidence showed that the company had purchased coal sufficient for its needs until summer at a high price for poor quality. The town argued that the entire burden of this bad bargain should not be put upon the gas consuming public, but the board declared that the gas company was entirely justified in using its best judgment to prevent a serious fuel shortage. Th judgment was fairly exercised (even though changed conditions showed that a different decision might have resulted in greater economy) and the operating cost resulting from that judgment is a proper charge to the consumer.

Mr. Cortelyou called for a few words from Mr. W. H. Gartley, who, speaking for the National Committee on Gas and Electric Service, said:

"I have very little to say because, as the Chairman has pointed out, the work of the Committee on Gas and Electric Service is now closed and part of it is history.

"I had hoped we might get some recognition from the Government regarding this service committee—that there might be some expression here from the other side. I am told that later, on behalf of the Ordnance Department and two other branches of the Service, there will be some record made of the assistance offered by the Committee. The historian will come in time, for the gas people, with their side partners, the electrical people, have done a vast and important amount and quality of work which has yet to be written up."

Mr. Cortelyou then called upon Mr. Walton Clark and Mr. Arthur Hewitt, short addresses from whom brought the program to a close. Mr. Clark recalled the successes of gas societies in the past and saw therein the note of assurance that the new Association would meet the questions and obligations of its day with vigor and with courage. Mr. Hewitt congratulated the Conference on the success of its Chairman and expressed his pleasure at being present when the first meeting of the new Association was launched under such favorable auspices.

Mr. Hewitt said in part:

"In most of the discussions, with all the personal and selfish interests necessarily involved, I have heard that higher note of national Service and Conservation. I think the ideals set forth by the Chairman at the opening of the session must have given the general tone to the proceedings, as the discussions and the papers have been on the best possible plane.

"I am among those who believe that we should not try to sell to the public what is not the best thing for them. If what we have

is not the best thing, let us try to make it the best thing; for in the long run what is not good for the public is not good for the gas company. But, if I may be permitted to speak for the Canadian Gas Association, it is to express their gratification that this Association has been so sensibly launched, and this Convention or Conference has been such an unqualified success."

The President, Mr. George B. Cortelyou, then dismissed the meeting with the following remarks:

"You have borne patiently with my holding this session until we could complete the business arranged for to-day.

"In bringing this Conference to a close I desire to thank you for the interest you have shown in the proceedings and for the encouragement your presence has brought to the Executive Board and to the officers. And I especially want to thank those gentlemen who by the preparation of papers and other participation in the exercises have done so much to make this meeting the successful one it has been.

"There have been some kindly references to the part some of us have played in the work of the American Gas Association. Whatever has been said with reference to the Chairman I want to pass on largely to my very devoted and efficient staff. They have worked early and late. It is not a very large staff, but I believe it is a very loyal and a very efficient staff.

"I hope you will return to your companies and to your respective fields of labor with the conviction that the Association is going to be of real service, not only to the gas industry but to the public.

"And now I declare this Conference formally adjourned."

Association Meetings Announced

THE Pennsylvania Gas Association has announced its eleventh Annual Convention for April 9 to 11, at Williamsport, Pa., with headquarters at the Park Hotel. The annual meeting of the Council of the Association will be held on Tuesday evening, April 8, at 8 o'clock. Among the items of special interest on the program are an address by Mr. Walton Clark on "Government Ownership or Operation of Utilities," an address by a representative of the Pennsylvania Public Service Commission, a report by Mr. J. B. Klumpp on the "Military Needs Committee," a paper on "Lighting Possibilities" by Mr. W. A. Morris, a paper on "The Gas Industry's Response to the Military Needs of the Nation" by Dr. Horace C. Porter, "Reconstruction" by Mr. J. G. Reading, "War Experiences" by Major Griffin Gribbel, "Store Room Management" by Mr. A. M. Boyd, and "Industrial Relations" by Mr. J. B. Douglas. An official representative of the American Gas Association will be present.

Address all communications to Mr. L. R. Dutton, Secretary, Jenkintown, Pa.

The Southwestern Electrical and Gas Association will hold its fifteenth Annual Convention at Galveston, Tex., on May 12-14, with headquarters at Hotel Galvez. This three-day convention will be divided as follows:

MAY 12:

A. M.—Committee meetings.

P. M.—Opening session, President's address, appointments, Secretary's report, etc.

MAY 13 AND 14:

A. M.—Separate operating sessions of gas, electric light and power, and street railway sections.

P. M.—General session. Discussion of all utility problems, followed on May 14 by committee and financial reports.

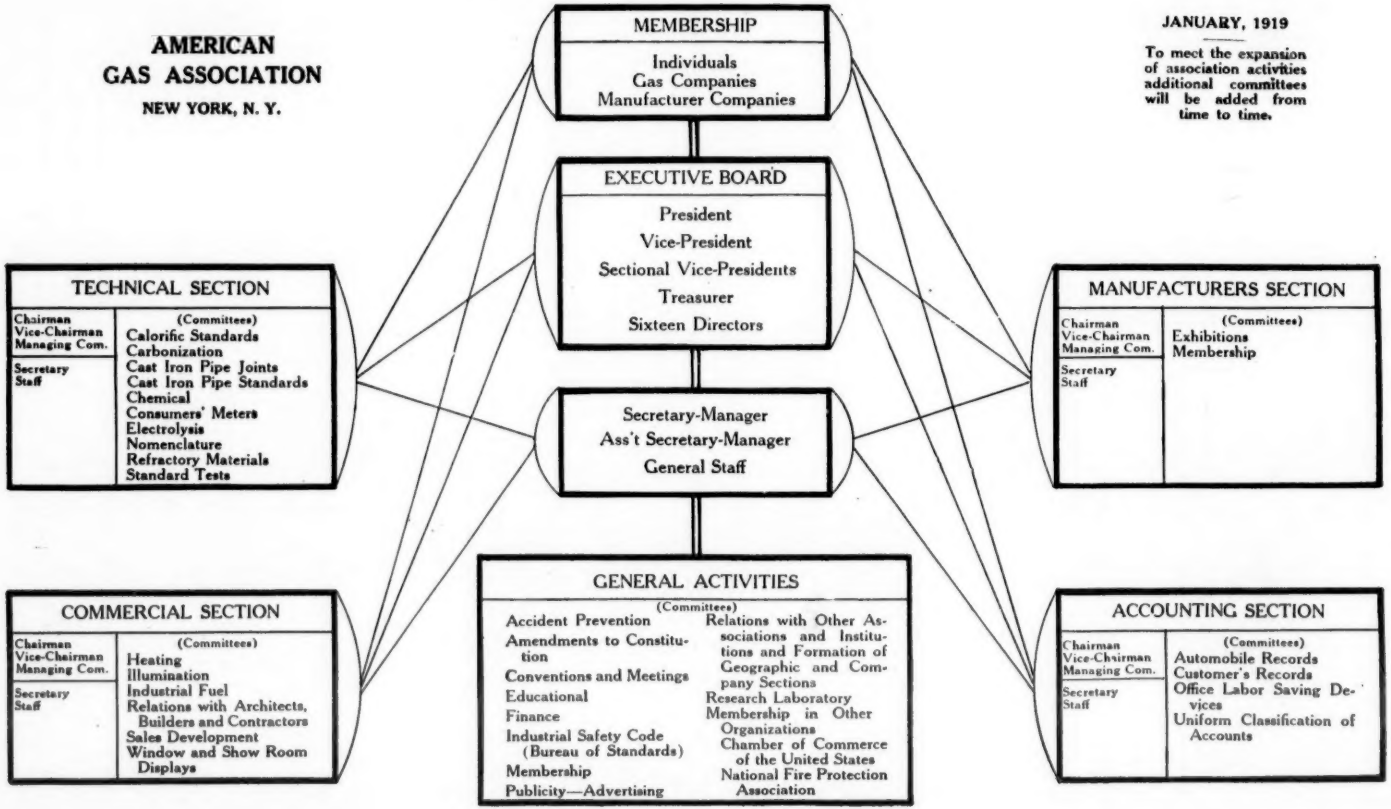
Address all communications to Mr. H. S. Cooper, 403 Slaughter Bldg., Dallas, Tex.

ORGANIZATION CHART

AMERICAN GAS ASSOCIATION
NEW YORK, N. Y.

JANUARY, 1919

To meet the expansion of association activities additional committees will be added from time to time.



Simple and Comprehensive Organization Plan Facilitates American Gas Associaiton Activities

AS it has been pointed out in a membership prospectus recently issued by the Association headquarters' office, there is one very difficult problem to be faced in organizing a society that is intended to accomplish results in a number of allied fields. It is the problem of concentrating powers and responsibilities to such an extent that work proceeds in a systematic manner without overlapping of activities, at the same time that leeway enough is given to individuals or special interests to keep their activity at a high point and to permit of a wholesome specialization along particular lines.

The success of the organizers of the American Gas Association in thus combining centralization and specialization of powers and undertakings, we believe is graphically shown in the chart here printed.

The membership (composed of individuals, gas companies and manufacturer companies) is directly represented by an Elective Executive Board and a permanent Headquarter's staff. From these three all orders are issued and through them all work is carried on.

Directly under their control are the "general activities" of the Association which are conducted through committees appointed for the purpose. The "general activities" are of such a nature that any gas man, whether his own particular line is selling ranges or manufacturing gas, is interested in them as bearing on the prosperity or advancement of the industry as a whole.

This organization permits a broad covering of the whole field with that wide vision which sees details in their relatively small places while it does not unduly magnify plans or undertakings of admitted importance.

Co-ordinated with this central organization are special sections likewise originating in the membership and working through the central staff. But because each section has a complete organization of its own, with committees of its own, the various phases of the gas industry can be taken up as matters for specialized work by men who are fully fitted to handle them. Every section reports back to the Association as a whole its work and its results.

Furthermore, there is sufficient flexibility in the plan to permit the adding of new committees within a section or under the head of "general activities," without disorganizing the whole, and there is every possibility of adding a new section to the Association for more highly specialized work when any problem or group of related problems has assumed an importance that warrants the addition.

We would recommend to each member of the Association that he study carefully this chart, for his realization of the importance of his own place in the organization as well as his understanding of how he can assist in general and sectional activities will depend upon an understanding of the attempt which the organizers of the American Gas Association have made to create a gas society where the general and the special needs of the industry can both have full attention.

Affiliation Agreement With Other Gas Societies

ARTICLE VII of the Constitution of the American Gas Association adopted on June 6, 1918, provides that "The Executive Board may make with any similar association an affiliation agreement, providing the objects or interests of such association are not in conflict with those of the American Gas Association."

In accordance with the power granted, on February 14, at a meeting of the Executive Board, the following form of Affiliation Agreement was drawn up, and approved and will be submitted to all gas societies and organizations, and especially to the societies formerly affiliated with the American Gas Institute, for their consideration.

The New England Association of Gas Engineers, on February 19, signed the agreement and has thus earned the distinction of becoming the first gas society to affiliate with the new national organization.

AFFILIATION AGREEMENT
BETWEEN THE
AMERICAN GAS ASSOCIATION
AND THE

.....

The AMERICAN GAS ASSOCIATION and the ..... having in view the promotion of closer relations and cordial co-operation in all branches of the gas industry, hereby agree, to affiliate in accordance with Section I, Article 7, of the Constitution of the AMERICAN GAS ASSOCIATION adopted June, 1918, copy of which is attached to this agreement.

The ..... shall be entitled to select from their organization one member for each of the four or more managing committees of the AMERICAN GAS ASSOCIATION Sections. The representatives selected shall be members of the AMERICAN GAS ASSOCIATION and their appointment be subject to the approval of that organization.

The ..... shall furnish to the AMERICAN GAS ASSOCIATION one copy of their *Annual Proceedings* and shall receive in return one copy of the *Annual Proceedings* and the MONTHLY of the AMERICAN GAS ASSOCIATION. They shall be entitled also to space in the AMERICAN GAS ASSOCIATION MONTHLY for announcements to their members.

The ..... may have access to the AMERICAN GAS ASSOCIATION'S classified data and information. They shall also have the privilege of consultation with and shall consider the counsel of the AMERICAN GAS ASSOCIATION'S committees before taking final action on subjects of national concern to the gas industry.

The AMERICAN GAS ASSOCIATION shall appoint a delegate to represent the organization at the Annual Convention of the ..... and he shall be accorded the privileges of participating in the sessions.

This agreement may be cancelled by either party giving one year's notice in writing, to the secretary of the other association, or it may be amended upon agreement by both parties.

AMERICAN GAS ASSOCIATION

Authorized by the Executive Board, February 14, 1919

(To be signed by President and Assistant Secretary-Manager for A. G. A., and by President and Secretary for other society)

Authorized by the.....

State Chairmen of Membership Committee Start Active Campaign

THE Membership Committee of the American Gas Association has undertaken an active campaign for the purpose of making the company membership enrollment in the Association include 100 per cent. of the gas companies in each state.

To facilitate the work and to make use of the circle of local influence which a progressive gas man possesses, the following Committee of State Chairmen has been appointed.

Alabama—S. B. Irelan, Montgomery Light & Water Power Co., Montgomery
Arizona, New Mexico, Utah, Nevada—George H. Waring, Utah Gas & Coke Co., Salt Lake City, Utah
California—A. B. Macbeth, Southern California Gas Co., Los Angeles
Colorado—C. N. Stannard, Denver Gas & Electric Co., Denver
Connecticut—J. A. Norcross, New Haven Gas Light Co., New Haven
Delaware—W. A. Morris, Wilmington Gas Co., Wilmington
Florida—Rosco Nettles, Tampa Gas Co., Tampa
Georgia—R. C. Congdon, Atlanta Gas Light Co., Atlanta
Illinois—O. E. Norman, Peoples Gas Light & Coke Co., Chicago
Indiana—S. E. Mulholland, Northern Indiana Gas & Electric Co., Fort Wayne
Iowa—H. R. Sterrett, Des Moines Gas Co., Des Moines
Kansas—W. H. McKenzie, Wyandotte County Gas Co., Kansas City
Kentucky—Donald McDonald, Louisville Gas & Electric Co., Louisville
Louisiana—H. S. Cooper, Secretary, Southwestern Electrical & Gas Association
Maine—Burton Smart, Portland Gas Light Co., Portland
Maryland and District of Columbia—Herbert K. Dodson, Consolidated Gas, Electric Light & Power Co., Baltimore
Massachusetts—J. B. Anderson, Brockton Gas Light Co., Brockton
Michigan—Glenn R. Chamberlain, Grand Rapids Gas Light Co., Grand Rapids
Minnesota—Arthur H. Rand, Minneapolis Gas Light Co., Minneapolis
Mississippi—LeRoy Heavner, The U. G. I. Co., Vicksburg
Missouri—J. J. Burns, Laclede Gas Light Co., St. Louis
Montana—R. C. Cardell, Billings Gas Co., Billings
Nebraska—W. H. Taylor, Omaha Gas Co., Omaha
New Hampshire—W. F. Norton, Nashua Light, Heat & Power Co., Nashua
New Jersey—R. R. Young, Public Service Gas Co., Newark
New York—E. S. Chapin, Empire State Gas & Electric Co., New York
North Carolina—Noble L. Clay, Carolina Power & Light Co., Raleigh
North Dakota—E. E. Harnish, Union Light, Heat & Power Co., Fargo
Ohio—A. K. Young, Toledo Railways & Light Co., Toledo
Oregon—H. M. Papst, Portland Gas & Coke Co., Portland
Pennsylvania—W. O. Lamson, Chester County Gas Co., West Chester
Rhode Island—Capt. William McGregor, Pawtucket Gas Co., Pawtucket
South Carolina—C. M. Benedict, Charleston Consolidated Railway & Lighting Co., Charleston
South Dakota—A. S. Graham, Sioux Falls Gas Co., Sioux Falls
Tennessee—S. E. DeFrese, Chattanooga Gas Co., Chattanooga
Texas—H. S. Cooper, Secretary, Southwestern Electric & Gas Association, Dallas
Vermont—H. E. Olds, Twin State Gas & Electric Co., 55 Congress St., Boston, Mass.
Virginia—B. B. Ferguson, Portsmouth Gas Co., Portsmouth
Washington—F. K. Lane, Seattle Lighting Co., Seattle
West Virginia—L. H. Ware, Martinsburg Gas Co., Martinsburg
Wisconsin—R. O. Jasperson, Milwaukee Gas Light Co., Milwaukee
Canada—G. W. Allen, Consumers Gas Co., Toronto, Ontario

For each of these men, the Association has made up a list of the gas companies of his state not yet holding company membership in the Association and arrangements have been made to keep each man informed of changes in his list.

The chairmen have further been given a supply of enrollment blanks, charts showing the organization of the association, lists of company members in their respective states and a carefully prepared prospectus giving the advantages and benefits to be received from company membership.

The prospectus, a folder of four large pages, printed in two colors, offers as its convincing argument the facts that all gas companies are working for prosperity, and that the American Gas Association, supported by the units of the industry is in a position to assist materially in the accomplishment of that aim. Tangible services open to company members are listed and the folder ends with an invitation from President Cortelyou to all gas companies to join the new Association.

Each state chairman will see that the non-member companies of his state are approached with all the force of the argument and appeal, and from month to month the success of their efforts as shown in new enrollments will be published in the Monthly. From June 6, 1918 to February 15, 1919, the following members have enrolled in the American Gas Association.

New Members Enrolled in the American Gas Association, July 16, 1918---February 28, 1919, Inclusive.

GAS COMPANY MEMBERS

Southern Utilities Co.	H. R. Rosebro, Palatka, Fla.
Peru Gas Co.	S. E. Mulholland, Peru, Ind.
Keene Gas & Electric Co.	Ralph D. Smith, Keene, N. H.
Astoria Light, Heat & Power Co.	L. B. Gawtry, Astoria, N. Y.
Glens Falls Gas & Electric Light Co.	H. M. Collin, Glens Falls, N. Y.
Carolina Power & Light Co.	Noble L. Clay, Raleigh, N. C.
Greenville Natural Gas Co.	A. C. Hartzell, Greenville, Pa.
Utah Power & Light Co.	P. M. Parry, Ogden, Utah.
Wisconsin Public Service Co.	C. R. Phenicle, Green Bay, Wis.
Sheboygan Gas Light Co.	A. F. Davey, Sheboygan, Wis.
Vancouver Gas Co., Ltd.	John Keillor, Vancouver, B. C.
Victoria Gas Co., Ltd.	S. J. Halls, Victoria, B. C.

MANUFACTURING COMPANY MEMBERS

By-Products Coke Corp.	W. W. Davis, Chicago, Ill.
The Cleveland Heater Co.	Leo Friedman, Cleveland, Ohio.
James B. Clow & Sons	E. V. Daily, Chicago, Ill.
Eriez Stove & Mfg. Co.	Jos. E. Nason, Erie, Pa.
Stanley G. Flagg & Co.	Stanley G. Flagg, Philadelphia, Pa.
General Briquetting Co.	J. B. McGraw, New York, N. Y.
General Fire Extinguisher Co.	Geo. S. Barrows, Providence, R. I.
The Hoffman Heater Co.	T. G. Arrowsmith, Lorain, Ohio.
The C. M. Kemp Mfg. Co.	W. W. Kemp, Baltimore, Md.
Kidde & Co.	R. Kidde, New York, N. Y.
Kramer Bros. Lamp Co., Inc.	Abraham Kramer, New York, N. Y.
Maryland Meter Works	E. S. Dickey, Baltimore, Md.
The Meyercord Co.	G. Harry Frank, Chicago, Ill.
The Peninsular Stove Co.	Alfred B. Moran, Detroit, Mich.
B. Ryan Co.	Bernard Ryan, New York, N. Y.
Selas Co.	Thos. F. Crean, New York, N. Y.
Semet-Solvay Co.	L. M. Whitwell, Syracuse, N. Y.
Tate-Jones & Co., Inc.	L. B. Richards, New York, N. Y.
Nathaniel Tufts Meter Works	H. A. Norton, Boston, Mass.
Vesta Gas Range & Mfg. Co.	F. F. Sparks, Chattanooga, Tenn.
Young Bros. Co.	G. G. Parry, Detroit, Mich.

ACTIVE MEMBERS

CALIFORNIA

J. B. Clow & Sons, San Francisco
F. A. Hamilton

Pacific Gas & Electric Co., San Francisco
John A. Britton

COLORADO

Denver Gas & Electric Light Co., Denver
E. P. Gartland
Truman D. Keyes
M. E. Malone

CONNECTICUT

The Gas Appliance Exchange, Bridgeport
W. H. Scribner

DISTRICT OF COLUMBIA

Bureau of Standards, Washington
Walter M. Berry

Washington Gas Light Co., Washington
I. H. Entwisle

FLORIDA

J. B. Clow & Sons, Tampa
G. W. Bean

GEORGIA

Savannah Gas Co., Savannah
Herbert C. Gross

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C. I. Carlson
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Harvey W. Edmund
Edward Garrity
F. M. James
F. Karl Lamb
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F. E. Robinson
C. B. Strohn
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F. W. Vilven

J. B. Clow & Sons, Chicago
F. E. Hutchins

Peoples Gas Light & Coke Co., Chicago
Frank F. Cauley
Samuel Insull
Bernard Olson

Republic Flow Meters Co., Chicago
J. M. Spitzglass

Freeport Gas Co., Freeport
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Eclipse Gas Stove Co., Rockford
Frank Aduddle
Watson E. Derwent

INDIANA

Western Gas Construction Co., Fort Wayne
F. H. Beebe

Northern Indiana Gas & Elec. Co., Hammond
B. P. Shearon
J. C. Young

United Gas & Electric Co., New Albany
L. D. Spragle

IOWA

Des Moines Gas Co., Des Moines
Henry Clay Adams
Edmund H. Martin

Muscatine Lighting Co., Muscatine
Robert F. Galpin

KENTUCKY

Louisville Gas & Electric Co., Louisville
Halford Erickson

MARYLAND

Bartlett-Hayward Co., Baltimore
W. J. McGurty

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Boston Consolidated Gas Co., Boston
W. K. Eavenson
J. L. Richards

New England Fuel & Trans. Co., Boston
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Chas. H. Tenney & Co., Boston
L. J. Willien, Jr.

Walworth Mfg. Co., Boston
Fred L. Carter, Jr.

East Boston Gas Co., Chelsea
Joseph M. Riley

New Bedford Gas & Edison Light Co., New Bedford
Robert Lindsay
William H. Snow

MICHIGAN

Semet-Solvay Co., Detroit
H. L. Comin

Commonwealth Pr., Ry. & Lt. Co., Jackson
F. A. Newton

MINNESOTA

Laclede Gas Light Co., St. Louis
John H. Viereg

Minnesota By-Product Coke Co., St. Paul
Carl D. Ulmer

MISSOURI

Laclede Gas Light Co., St. Louis
J. F. Bulfin
J. J. Burns
G. H. Curry
J. M. Curtin
S. William Dodd
Edwin Dowley
J. L. Eigenbrot
F. W. Frerichs

A. E. Garvin
C. L. Holman
E. P. Lynch
James McElevey
J. E. McLeod
C. G. Murdoch
William Murphy
E. S. Murray
C. J. Nicholls
H. H. Pipkin
J. E. Pipkin
C. H. Stewart
J. D. Von Maur
H. C. Wehnert
W. H. Whitton

NEBRASKA

Omaha Gas Co., Omaha
John M. Watt

NEW JERSEY

Camden Iron Works, Camden
Edgar R. Eavenson

Consolidated Gas Co. of N. J., Long Branch
Fred R. Cutcheon

Public Service Gas Co.

Camden
S. T. Corliss
W. E. Shreve

East Orange
Roy E. Alward
G. A. S. Cooper

Englewood
Albert Clabaugh

Jersey City
James Ashworth
L. A. Charles
Stewart B. DeCamp
W. Greacen, Jr.
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J. H. Neighbour
Robert H. Philipps, Jr.

Morristown
Conrad Schuck

Newark
Philip H. Bean
Thomas N. McCarter
Ormsby F. Potter

New Brunswick
Jay C. Roberson

Plainfield
Thomas L. Mellick

Princeton
John F. Hoff

South Amboy
Christie Dufford

NEW YORK

Municipal Gas Co., Albany
Nicholas F. Brady

Empire Gas & Electric Co., Auburn
William P. Moran

Binghamton Gas Works, Binghamton
George Steinwedell

Brooklyn Union Gas Co., Brooklyn
Charles C. Atwood
F. S. Benson, Jr.
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George Bradley
John H. Braine
M. Elton Brown
Robert W. Bush
E. J. Byrne
Edward L. Byrne
Clyde E. Cheeseman
Charles A. Cross
H. O. A. Dembke
John C. Devlin
D. C. Ebbetts
Charles McCabe Ford
George W. Gatehouse
James Gilmer
Raymond L. Greene
G. L. Hallock
H. M. Harriman
Walter S. Hicks
M. E. Hooper
W. A. Jack
Edwin duBoise Jones
Thomas P. Kennedy
George M. Kirchner
Walter W. Kunze
Edmund C. Lackersteen
Raymond C. Lewis
H. A. Lovell
Robert MacSaveny, Jr.
William F. McDonald
Henry E. McGowan
Samuel A. Mills
Edward J. Murphy
T. P. Payne
A. H. Schaaf
Henry Schreiner
Edgar L. Shultz
Edward M. Smith
Arthur S. Staniford
Andrew J. Voorhees
D. S. Voorhees
John H. Waldron
C. L. Wellander
Herbert Wellington
W. M. Wepfer
John T. White
Thomas F. Whitty, Jr.
A. M. Wilson
Prescott B. Wiske
Frederick R. Wogan
Henry A. Wuest

Welsbach Gas Lamp Co., Buffalo
C. E. Richman

Glens Falls Gas & Elec. Lt. Co., Glens Falls
Henry Rochat

Fulton County Gas & Elec. Co., Gloversville
H. D. O'Brien
Raymond N. Zeek

American Light & Traction Co., New York
Walter C. Beckjord
Emerson McMillin

Brazilian Traction, Lt. & Pr. Co., New York
L. J. Hirt

Central Union Gas Co., New York
Peter Ebert
Thomas A. Hillgrove
Charles S. Morton
Amato Perretti
W. E. Shepard, Jr.

J. B. Clow & Sons, New York
W. F. Latimer

Consolidated Gas Co., New York
George E. Bennitt
John D. Collins
Frank J. Fieser
Charles J. Gefvert
John J. Jalien
A. P. Schmidt
Frank G. Smith
George F. Stevens

The Cutler-Hammer Mfg. Co., New York
William H. Jefferson

Henry L. Doherty Co., New York
Henry L. Doherty
Henry O. Loebell

Electric Bond & Share Co., New York
E. K. Hall

Albert F. Ganz, Inc., New York
L. A. Hazeltine

New Amsterdam Gas Co., New York
Oliver H. Smith
C. H. Stevick

New York Mutual Gas Light Co., New York
Thomas W. Smith

Pintsch Compressing Co., New York
J. Alfred Dixon

Plant Eng. and Equipment Co., New York
Theodore Haight

Wilputte Coke Oven Corp., New York
Louis Wilputte

Rochester Railway & Light Co., Rochester
C. H. Stone

Semet-Solvay Co., Syracuse
William H. Blauvelt
L. M. Whitwell

OHIO

The Delaware Gas Co., Delaware
Thomas Clive Jones

Columbus, Delaware & Marion El. Co., Marion
A. F. Van Deinse

Republic Iron & Steel Co., Youngstown
Caleb Davies, Jr.

PENNSYLVANIA

Allentown-Bethlehem Gas Co., Allentown
Allyn C. Taylor

Philadelphia Sub. Gas & El. Co., Chester
Jerome Brandes
Thomas Collins
Lawrence B. Fulton
Ralph E. Jones
J. J. Morrissey
R. G. Porter
William G. Sterrett

Philadelphia Sub. Gas & El. Co., Jenkintown
L. R. Dutton
George L. Rubicam

American Gas Co., Philadelphia
P. W. Cannon
A. W. Warner

Day & Zimmerman, Inc., Philadelphia
Clarence R. Bitting

The United Gas Imp. Co., Philadelphia
Harry B. Christy
A. Frederick Kunberger
Charles J. O'Donnell
H. Craig Sutton

U. S. Cast Iron Pipe & Fdy. Co., Philadelphia
L. R. Lemoine

Westmoreland Coal Co., Philadelphia
William H. Parish
George B. Seyms

Automatic Gas-Steam Radiator Co., Pittsburgh
T. J. Easter

Koppers Co., Pittsburgh
Albert W. Grant, Jr.
Frank E. Hamilton

Philadelphia Co., Pittsburgh
E. J. Stephany

Pittsburgh Water Heater Co., Pittsburgh
J. C. Bowery

Northumberland County Gas & Electric Co., Sunbury
Charles H. Hodges

RHODE ISLAND

Blackstone Valley Gas & El. Co., Woonsocket
Forest J. Nason

SOUTH DAKOTA

Sioux Falls Gas Co., Sioux Falls
W. E. Bruce

UTAH

Utah Power & Light Co., Ogden
W. A. Huckins
Thomas Parker, Jr.

VIRGINIA

Portsmouth Gas Co., Portsmouth
C. S. Morse

WISCONSIN

Milwaukee Gas Light Co., Milwaukee
R. B. Brown
Sheldon J. Glass
Ewald Haase
H. M. Humphrys
R. O. Jasperson
John T. Mason
D. A. Powell
Bruno Rahn

CUBA

Havana El. Ry., Lt. & Pr. Co., Havana
W. E. Mockett

HAWAII
Honolulu Gas Co., Honolulu
Frank Q. Cannon

CANADA
Canadian Meter Co., Ltd., Hamilton
John B. McNary
Gas Journal Publishers, Ltd., Hamilton
Clarence H. W. Grace
Montreal Light, Heat & Pr. Co., Montreal
W. B. Johnson
J. S. Norris

ENGLAND
Richmond Gas Stove & Meter Co., London
Horace M. Thornton

BRAZIL
Pernambuco Tramway & Pr. Co., Pernambuco
Henry N. Balsam
W. C. Butler
Societe Anonyme du Gaz, Rio de Janeiro
Lewis J. Carder

CHILE
Compania de Gas, Santiago
J. Blanquier

NEW ZEALAND
The Christchurch Gas, Coal & Coke Co., Christchurch
R. C. Bishop

JAPAN
Osaka Gas Co., Osaka
Kyutara Miyoshi
Tokio Gas Co., Tokio
Einosuke Okawara

MISCELLANEOUS
H. M. Eaton, Union Trust Bldg., Detroit, Mich.
O. L. Kowalke, University of Wisconsin, Madison, Wis.
Carroll B. Nichols, 1506 17th St., N. W., Washington, D. C.
Yoshikiyo Oshima, Tokyo Imperial University, Tokyo, Japan
C. E. Reese, Illinois Public Utilities Commission, Springfield, Ill.
Milt H. Saul, Gas Record, Chicago, Ill.
Marvin Shiebler, 80 Broadway, New York, N. Y.
Clement C. Smith, First Natl. Bank Bldg., Milwaukee, Wis.
B. O. Tippy, Union Trust Bldg., Detroit, Mich.
John T. Westcott, 11 Strawberry Hill Road, Twickenham, Eng.
Thomas B. Whitted, Realty Bldg., Charlotte, N. C.
Samuel S. Wyer, Hartman Bldg., Columbus, Ohio.

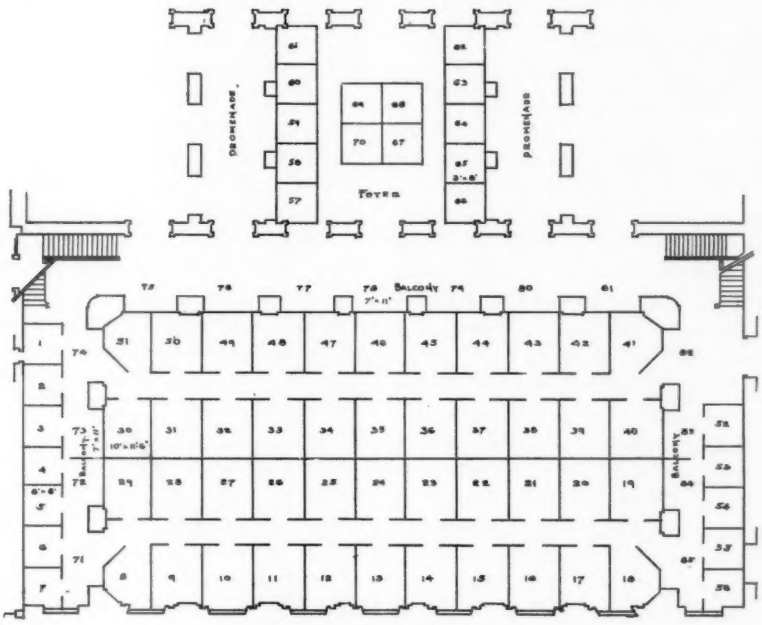
Space Divided for Exhibition at Hotel Pennsylvania in October

THE Manufacturers Section Committee which consists of A. P. Brill, Mabon P. Roper, John S. DeHart, Harry D. Shall, Sidney Mason, and W. W. Barnes, Secretary of the Section, has been at work perfecting plans for the exhibition of gas appliances and equipment which will be one of the great features of the First Annual Convention of the American Gas Association in October.

A cut published in the February issue of the American Gas Association MONTHLY showed the position of the exhibition hall in relation to the lobby and convention hall at the Hotel Pennsylvania. The cut which appears herewith is an enlargement of the exhibition hall itself, divided into the spaces which will be available to manufacturer company members of the Association for their demonstrations and displays.

On the main floor of the ballroom which the manufacturers will use, forty-four spaces measuring 10 by 11½, and twelve spaces measuring 8 by 8 have been provided. The balcony will be utilized for fifteen spaces each 7 by 11 feet. In the foyer just north of the main hall, and flanked by promenades, there are fourteen spaces measuring 8 by 8. This makes a total of eighty-five spaces.

Gas will be furnished for lighting appliances and for small specialties only, and the committee will be governed in the allotment of spaces, as far as may be nec-



PLAN OF EXHIBITION HALL
HOTEL PENNSYLVANIA
SEVENTH AVE. 32ND AND 33RD STS.
MANUFACTURERS SECTION
AMERICAN GAS ASSOCIATION

essary, by the character of the apparatus to be displayed, since no heavy exhibits can be allowed on the balcony or in the foyer.

The estimated cost per space is $90.00, a sum which covers all of the expenses of the exhibitor.

The Manufacturers Section announces that since the last issue of the MONTHLY the following firms have enrolled as company members of the Association:

Kramer Bros. Lamp Co., Inc., Abraham Kramer, 585 Broadway, New York, N. Y.
B. Ryan & Co., B. Ryan, 60 E. 10th St., New York, N. Y.
Cleveland Heater Co., Leo Friedman, Cleveland, Ohio.
Nathaniel Tufts Meter Works, H. A. Norton, Boston, Mass.
The Meyercord Co., G. Harry Frank, Chicago, Ill.
Tate-Jones Co., L. B. Richards, 50 Church St., New York, N. Y.
Parker-Russell Mining & Mfg. Co., Leigh Wickham, Laclede Bldg., St. Louis, Mo.
C. M. Kemp Mfg. Co., W. W. Kemp, Baltimore, Md.
Young Bros. Co., G. G. Parry, Detroit, Mich.
The Gas Machinery Co., W. E. Steinwedell, Cleveland, Ohio.
The Improved Equipment Co., A. F. Traver, 60 Wall St., New York, N. Y.

Artificial Gas and By-Products in 1917

Great Increase in Output

THE sales of artificial gas in the United States in 1917 amounted to 342,151,129,000 cubic feet, an increase over 1915, the next previous year for which comparable figures are available, of 29 per cent., according to a report compiled by C. E. Lesher, of the United States Geological Survey, Department of the Interior. The sales of water gas in 1917 amounted to 153,457,318,000 cubic feet, an increase of 24 per cent. over those in 1915, and represented 45 per cent. of the total artificial gas used. The sales of gas from by-product coke ovens, 131,026,575,000 cubic feet, increased 20 per cent. over 1916 and 55 per cent. over 1915. The gas sold from coal-gas plants (bench retorts) decreased from 43,747,432,000 cubic feet in 1915 to 42,927,728,000 cubic feet in 1917. The sales of oil gas increased from 13,971,333,000 cubic feet in 1915 to 14,739,508,000 cubic feet in 1917, a gain of 6 per cent.

The total coal gas produced in 1917—sold as well as lost or used by producers—amounted to 47,525,148,000 cubic feet, the manufacture of which consumed 4,960,297 net tons of bituminous coal, 106,627 gallons of oil, and 1,296 net tons of cannel coal, the oil and cannel coal being used as enrichers. The total water gas produced—174,357,536,000 cubic feet—required the use of 1,486,305 gross tons of anthracite, 7,815 net tons of bituminous coal, 1,448,173 net tons of coke (most of it produced by the same operators in coal-gas retorts), and 684,620,637 gallons of gas oil. The total oil gas produced—17,552,855,000 cubic feet—required the use of 137,484,874 gallons of oil. The quantity of bituminous coal charged into by-product coke ovens was 31,505,759 net tons, which produced 337,728,251,000 cubic feet of gas.

The sales of coke from coal-gas plants in 1917 amounted to 1,857,248 net tons, valued at $10,953,693, an increase of 12 per cent. in quantity and of 52 per cent. in value over 1915. The sales of by-product coke in 1917 showed an increase over 1915 of 59 per cent. in quantity and of 186 per cent. in value. The total quantity of the two kinds of coke marketed in 1917 amounted to 24,296,528 net tons, valued at $149,596,846, a net increase of 54 per cent. in quantity and 168 per cent. in value over 1915. Higher average values per ton were obtained for both kinds of coke.

The sales of tar from plants manufacturing coal gas, water gas, and oil gas, and from by-product coke ovens amounted to 335,578,441 gallons, valued at $8,631,993, in 1917, an increase over 1915 of 41 per cent. in quantity and of 38 per cent. in value. Oil-gas tar shows the greatest proportionate increase in quantity and coal-gas tar the only increase in average value.

The ammonia produced, reported in terms of liquor, sulphate, and anhydrous ammonia, has been computed as it equivalent in sulphate for convenience in comparison. Coal-gas retorts and by-product coke ovens produced approximately 652,333,000 pounds of sulphate, valued at $19,265,989, in 1917, an increase of 154,234,877 pounds, or 31 per cent. in quantity, and of $8,068,863, or 72 per cent. in value over 1915. Coal-gas ammonia showed a decrease in quantity and a small increase in value, whereas by-product coke-oven ammonia showed an increase in both quantity and value during the same two years.

The greatly increased sales of light oils show the extent to which this industry was stimulated by the war-time demand for the raw materials required for high

ARTIFICIAL GAS AND BY-PRODUCTS MARKETED IN 1915, 1916, AND 1917.[1]

Product	1915		1916		1917	
	Quantity sold	Value of sales	Quantity sold	Value of sales	Quantity sold	Value of sales
Gas (M cubic feet):						
Coal gas	43,747,432	$40,257,108	. . .	. . .	42,927,728	. . .
Water gas	124,129,569	112,281,956	. . .	. . .	153,457,318	. . .
Oil gas	13,971,333	12,668,169	. . .	. . .	14,739,508	. . .
By-product gas	84,355,914	8,624,899	110,061,607	$10,779,208	131,026,575	. . .
	266,204,248	173,732,132	. . .	. . .	342,151,129	. . .
Coke (net tons):						
Coal gas	1,662,552	7,198,377	. . .	. . .	1,857,248	$10,953,693
By-product	14,072,895	48,558,325	19,069,361	75,373,070	22,439,280	138,643,153
	15,735,447	55,756,702	. . .	. .	24,296,528	149,596,846
Tar (gallons):						
Coal gas	47,863,192	1,555,363	. . .	. . .	53,318,413	1,774,326
Water gas	51,381,911	1,118,656	. . .	. . .	59,533,208	1,358,683
Oil gas	64,433	4,268	. . .	. . .	727,595	32,682
By-product	138,414,601	3,568,384	185,506,024	4,865,921	221,999,264	5,566,302
	237,724,137	6,246,671	. . .	. . .	335,578,441	8,631,993
Ammonia sulphate or equivalent (pounds)						
Coal gas	103,842,035	1,329,651	. . .	. . .	91,540,590	1,362,125
By-product	394,256,000	9,867,475	470,530,547	14,152,243	560,792,322	17,903,864
	498,098,035	11,197,126	. .	. . .	652,332,912	19,265,989
Light oils (gallons)[2]						
Coal gas	526,651	39,004	. . .	. . .	770,298	448,855
Water gas	788,876	59,840	. . .	. . .	6,420,717	1,655,204
Oil gas	. . .	. . .	. . .	. . .	205,475	74,035
By-product	16,600,857	7,337,371	43,714,429	30,003,360	54,427,266	28,655,204
	17,916,384	7,436,215	. . .	. . .	61,823,756	30,833,298
Crude naphthalene (pounds):						
Coal gas	222,925	3,565	. . .	. . .	383,349	9,584
Water gas	. . .	. . .	. . .	. . .	16,548	103
By-product	465,865	46,959	8,820,405	289,688	17,276,044	569,449
	688,790	50,524	. . .	. . .	17,675,941	579,136
Retort carbon (net tons):						
Coal gas	120	1,362	. . .	. . .	252	2,733
Water gas	741	8,511	. . .	. . .	1,068	12,067
Oil gas	19,500	167,700	. . .	. . .	21,991	204,536
	20,361	177,573	. . .	. . .	23,311	219,336

[1] Other products not included in this table, valued at $396,007 in 1915, $1,841,175 in 1916, and $1,145,633 in 1917 were: From coal-gas plants, creosote, tar distillery products, pitch, coke breeze, and spent oxide; from oil-gas plants, lampblack, petroleum coke, briquets, and yellow prussiate of soda; from by-product coke oven plants, coke breeze, sodium ferrocyanide, residue, drip oil, and spent oxide.

[2] Includes crude light oil, secondary light oil, benzol, toluol, and solvent naphtha.

PRODUCTION OF ARTIFICIAL GAS AND FUELS CONSUMED IN ITS MANUFACTURE

Fuel	Coal gas	Water gas	Oil gas	By-product gas
Anthracite . . . . . gross tons	. . .	1,486,305	. .	. . .
Bituminous . . . . . net tons	4,960,297	7,815	. . .	31,505,759
Coke . . . . . net tons	. . .	1,448,173	. . .	. . .
Oil . . . . . gallons	106,627[3]	684,620,637	137,484,874	. . .
Cannel . . . . . net tons	1,296[3]	. . .	. .	. . .
Product . . . . . M cubic feet	47,525,148	174,357,536	17,552,855	337,728,251

[3] Used as enricher.

explosives. Crude light oil, secondary light oil, benzol, toluol, and solvent naphtha aggregated 61,823,756 gallons, valued at $30,833,298, an increase of 245 per cent. in quantity and 315 per cent. in value over 1915. In 1917 the quantity of light oil obtained from coal-gas retorts was 770,298 gallons, compared with 526,651 gallons in 1915, a gain of 46 per cent. The value of the product increased ten-

fold. The quantity of light oil produced at water-gas plants in 1917 was 6,420,717 gallons, a gain compared with the 788,-876 gallons produced in 1915, of 5,631,-841 gallons, or 714 per cent. The value of the product increased twenty-fold. No light oil was recovered in the manufacture of oil gas in 1915; the total amount so produced in 1917 was 205,475 gallons. Oils produced at by-product coke ovens increased from 16,600,857 gallons in 1915 to 43,714,429 gallons in 1916, and to 54,427,266 gallons in 1917, the percentages of increase being, respectively, 163 and 25 per cent.

Crude naphthalene shows a remarkable increase—from 688,790 pounds, valued at $50,524, in 1915, to 17,675,941 pounds valued at $579,136, in 1917. The largest increase was in the output of naphthalene from by-product ovens, which increased from 465,865 pounds in 1915 to 8,820,405 pounds in 1916, and again to 17,276,044 pounds in 1917. Water-gas plants reported in 1917, for the first time, a recovery of crude naphthalene, the product amounting to 16,548 pounds.

The sales of retort carbon in 1917 amounted to 23,311 net tons, valued at $219,336, the greater part of which was produced in oil-gas retorts. By far the largest proportion of the retort carbon produced is burned by the operators themselves and is, therefore, not reported here.

Statistics showing the production and sales of artificial gas and by-products and the fuels used in 1915, 1916, and 1917 are shown in the accompanying tables.

—*U. S. Geological Survey,*
February, 1919.

Readjustment of Prices on Basic Materials

WITH the approval of President Wilson, an "Industrial Board of the Department of Commerce" has been formed, composed of representatives from industry, labor and the Government, under the chairmanship of George N. Peek.

The purpose of the Board is to put into practical effect a program for the readjustment of prices on basic materials, in such fashion as to create a firm foundation on which consumer and producer can form necessary estimates.

The Board has the assistance of the Council of National Defense.

Attention is called to the present situation in which prices on basic materials and staple foods, ranging from 50 to 250 per cent. of normal, occasioned by war demands, continue to prevail. Activities suspended during the war are not being resumed at once, because of abnormal prices on materials and labor, and buying is suspended in spite of a large latent buying power in the country. The stagnant condition of business is traceable to abnormal prices which, once fixed, in many cases by governmental agencies, have continued because no agency has been provided to bring about reductions.

In meeting the situation, we are asked to remember that Government, industry and labor are all equally interested. The vital need is resumption of industrial activities and this depends upon prices that will at once create confidence in the buying public. The Board, therefore, offers the following suggestions for procedure:

Consultation and conference between the Board and leaders of industries—especially those producing basic materials

like steel, lumber, textiles, with a view to a thorough analysis of conditions and the formation of a schedule of revised prices.

Assistance to industries in the disposal of surplus war materials in such manner as to have as little detrimental effect on private activities as possible.

Special efforts to assist industry to resume activities, and to reduce prices to such an extent as will bring the buying power of the Government itself into action.

Such a procedure will, in substance, bring the law of supply and demand back into action and from that time forward, this economic law will control selling prices of materials and the trend, it is believed, will be upward and not downward.

—Abstracted from statement issued by
HONORABLE WILLIAM C. REDFIELD,
Secretary of Commerce.

Stable Basis for Public Utilities

In an address delivered before the Conference of Governors and Mayors, held at the White House on March 4, Mr. Roger W. Babson, of the Information and Educational Service of the U. S. Department of Labor, said:

"In addition to this work of stimulating public and private construction of school houses and other public buildings, private residences and wage workers' homes, sewers, water works and other municipal improvements, the Labor Department is making a special drive to get public utilities on a stable basis. The Secretary is especially sympathetic with the needs of the traction companies, believing that they deserve higher fares and relief from taxation and other burdens. Studies are now being made by the Secretary's office for plans which will stabilize the public utility industry."

An Unsolicited Editorial

The following editorial appeared in the March 14 copy of the Newburgh *Daily News*. The value of such publicity needs no comment. This reprint is of interest to our Association members as visible proof of the fact that favorable publicity for a utility company is forthcoming where the policy of the company has pleased the public. In other words, "the public be pleased" is a perfectly practicable statement of a feasible plan for conducting a public utility.

LOCAL EXAMPLE OF THE BEST KIND OF "PUBLIC" OWNERSHIP.

Central Hudson Gas & Electric Co., representing a consolidation of heat, light and power concerns of Newburgh, Poughkeepsie and nearby towns, is one of a long list of corporations which have adopted for their motto, "The public be pleased." The Central Hudson company is one of the big assets of Newburgh and Poughkeepsie, because it is prepared for every development in the large territory it serves. It is ready to meet any industrial, commercial or household need. It maintains a service which could not be improved upon and which, owing to its emergency equipment and reserve, is rarely, if ever, interrupted even in the event of accident or storm. The Central Hudson company serves business men and the people so well that its business is steadily increasing, necessitating betterments and extensions which are to be financed through an issue of $750,000 of 7 per cent. convertible debenture bonds. The assets of this company are so large, its equipment is in such splendid condition, its business is so great and its prospects are so promising that an offer by it of $750,000 bonds, bearing 7 per cent. interest, to financial institutions and brokerage houses would be accepted on the instant. The company prefers, however, to distribute the bonds among home

(*Continued on page 147*)

Educational Department

Conducted by ALFRED E. FORSTALL

Water Heaters

DESIGN.—The principles and the details of the design of water heaters will not be minutely treated in these articles, because of limited space, and because of the relative unimportance of the subject to the average student of gas distribution, as compared to the mechanical details of proper installation and maintenance of the appliance. The succeeding brief description of the distinguishing features is intended merely to give the reader a very general idea of the designs with which he is probably familiar, if engaged in gas distribution work.

Water heaters may be studied in three major classes.

First, the ordinary circulating heater, which consists of a copper water coil about 24 inches long, enclosed in a cast iron cylindrical jacket. A gas burner at the lower end of the coil and within the jacket, heats the water within the coil and so starts a natural circulation of water, which is stored in a boiler and drawn off to be used after a sufficient quantity has accumulated.

Second, the combination boiler and water heater, which consists of a vertical boiler especially constructed with a stack through the center, in which is placed a coil or casting more or less like that used in the circulating heater. The only advantages of such an arrangement are a slight increase in efficiency and a greater compactness. The capacity is the same as that of the circulating type. Such a heater may be made automatic by the installation of a thermostat, so controlled by the temperature of the water that the gas supply is shut off when the boiler has become fully heated. Under these conditions the boiler is lagged, a flue is provided, and a continuously burning pilot flame employed.

Third, the automatic instantaneous heater which also uses the copper coil principle, but which is much larger and more substantial than the circulating heater. As indicated by the name, the water within the coil is heated almost instantaneously, and passes directly to the faucet without being stored. The automatic mechanism consists of a valve operated by the water pressure, which, by opening simultaneously with the faucet, permits the water to pass through the heater and opens the gas supply to the burners, and of a thermostatic device which shuts off the gas supply without stopping the water when the latter has reached the desired temperature.

Connection.—The circulating heater is relatively so small as not to render it, under usual conditions, an obstacle to passage or an objection to sight, and so it can be installed practically always, directly beside the boiler in which the hot water is to be stored. This results in the minimum requirements of installation, and the maximum efficiency of operation. Such a heater should not be placed in the cellar if the boiler is on the first floor, because of the possibility of the heater being left burning longer than necessary, perhaps even for a day at a time. This possibility is an objection also to an installation in a closed cellarway with the boiler in another location.

In general, a circulating heater should not be installed in small unventilated

space like a closet, not only because such a condition will be favorable for the accumulation of a concentration of the poisonous products of combustion, but also because, even if a flue is provided, the air supply needed by the burner is not adequately furnished in such a space. These principles prohibit also the installation of any heater in a bathroom, unless connected with a flue.

A heater of the combination type, when not automatic, may be installed to best advantage in the kitchen. When automatic, it should be installed in the cellar.

An automatic instantaneous heater in a residence should be installed in the cellar, at such a point that the hot water will be delivered through as short a length of combined new and old piping as possible.

The installation of a water heater usually is made by the "preinspection" system (A. G. A. MONTHLY, January, 1919). On the visit of the preinspector, the location is decided on and explained to the consumer, and then the appliance itself and the boiler to which it is to be connected, are examined to make sure that the former is completed and the latter, including the connecting pipes, in such good condition as to preclude the danger of damage when the pipe fitting work is being done.

Unless the appliance is of the "automatic instantaneous" type, the ordinary service pipe will supply sufficient gas. Under such extraordinary conditions, its capacity and the heater demand should be carefully checked, and unless there is a marked discrepancy between the two, the service renewal should not be ordered until an actual test has demonstrated that it is incapable of meeting the demand. The same procedure applies to the meter and its connections.

To supply the appliance, a separate gas line should be installed, because the ordinary system of housepiping has not, as a rule, been designed to carry so large an additional load. For a circulating or combination heater the size of this line, when less than 40 feet long, should be ¾ inch. When between 40 and 100 feet long, it should be 1 inch. For an "automatic instantaneous" heater, the size of the line should be determined by using the table of "Pipe Capacities" in the article on "Cooking Appliances" (A. G. A. MONTHLY, February, 1919). The size of the water connections for all types of heater may be taken as ¾ inch. Galvanized pipe and fittings should, of course, be used.

After the preinspector has cared for these preliminaries, and the appliance and material have been delivered, the "fitting gang" takes up the actual work of installation. The most complicated part of this work is the water piping. A few types of connection are here shown.

Circulating Heater to Horizontal Boiler.—Fig. 1 shows the water piping to be installed when connecting a circulating water heater to an ordinary horizontal boiler which originally was, and still can be, supplied with hot water from the water back of the coal range. *A* is the cold water line from the house supply to the boiler; *B*, the hot water line from the boiler to the house fixtures; *C* and *D*, the connections between the water back and the boiler. The pipes installed by the fitter when connecting the heater, are *E*, the hot water pipe from the heater to the boiler; *F*, the cold water pipe from the boiler (or water back) to the heater; and *G*, the gas line. A ½-inch clean-out plug is placed at *H*, for the purpose of removing sediment which may collect in the lower connections and affect the circulation of the water.

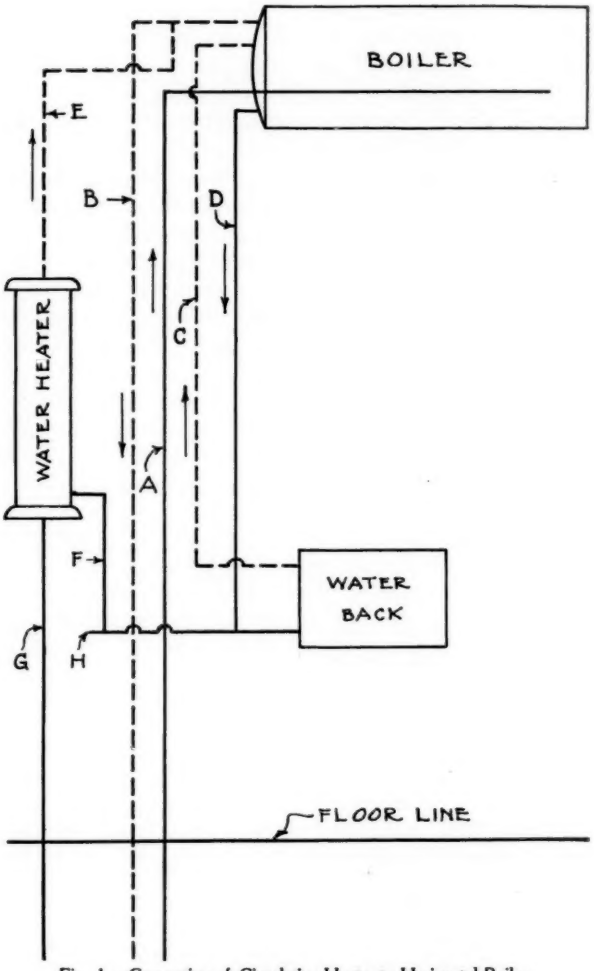


Fig. 1.—Connection of Circulating Heater to Horizontal Boiler.

The fitter should proceed with the installation as follows. After having shut off the water, a hot water spigot is opened, the clean-out plug is removed, and the boiler and connections are allowed to drain until the last trace of dirt or sediment has disappeared. This is very necessary, as a dirty condition will unfavorably affect the operation of the heater. It may be necessary to entirely empty, to fill and to re-empty the boiler, several times before proper results are obtained. If the boiler has been entirely emptied, the water connections to the heater should be made at that time. However, if no dirt appears when the clean-out plug is first removed, the tedious operation of emptying the boiler entirely may sometimes be omitted. In such cases, all the faucets on the system from which the water has been shut off, should be opened, and water drawn off from the clean-out plug until the boiler is about one-third empty. Then the

faucets should be tightly closed, and if they are air tight, the cold water pipes can be run between the boiler and the heater with a very small loss of water from the open boiler outlet. When the system is not tight, however, or if it is desirable to spill no water, the boiler must be emptied completely before the connection work is started. After the cold water piping has been finished and the heater placed upon it and joined to it by a union, a nipple long enough to reach above the level of the water (if any) in the boiler, may be inserted in the top outlet of the heater. Then the boiler connections can be broken at the top, and the hot water connection made without further loss of water.

At this time an investigation should be made to determine whether the "boiler tube" exists and is in good condition. If not, it should be furnished, as it is very essential to efficient operation. This tube preferably should be of copper and in the case of a vertical boiler, should be drilled with one or two 1/16-inch holes at the upper end, to prevent syphoning.

The following general rules should be observed when making the water connections:

Cocks or valves should not be used.

If water to the house is metered, a safety valve should be placed on top of the boiler, or a patent "relief" faucet installed, to provide against excessive pressure in the system, created by permitting the heater to burn for a long time without using any hot water.

A union should be installed on each (hot and cold) water connection. Good quality fiber washers are recommended for use in these unions.

As tight joints are a requisite, extraordinary efforts should be made to pull each thread very tight as the work is progressing. Jointing material should be used sparingly.

After the water connections have been completed, the water should be turned into the boiler and the pipe joints carefully examined to see whether leaks develop. Close attention to this may show a leak as soon as the water level reaches the defective joint, and thus time can be saved in cases where it will be necessary to empty the boiler to make the repair. After the water work has been completed, the gas and flue (when necessary) connections should be made, as explained under Cooking Appliances, in the February, 1919, issue of the MONTHLY. Then the burner should be adjusted and a brief test made of the whole installation. Fifteen minutes usually will be sufficient to bring to light any defects such as by-passing of water, or obstructions or leaks in piping.

Installing Combination Heater.—The installation of a heater of the combination type involves the principles that have been detailed for circulating heaters. The work, of course, is a little heavier, because a complete boiler is involved. When the heater is fitted with an automatic mechanism, the connections to the house water piping should be made either by the "direct" or the "reheat" systems, as explained below.

Instantaneous Heaters.—The design of the automatic instantaneous type of heater makes it unnecessary to provide any storage space, such as a boiler, for the hot water generated. In every case the heated water passes directly to the hot water faucet, the opening of which has automatically placed the heater in operation. There are two methods of connecting such a heater, with respect to the existing water piping system.

Fig. 2 shows the "direct" system of connection. The water enters the heater from *A*, the cold water house supply,

through connection *C*, and the hot water is delivered through connection *D*, into *B*, the hot water line to the fixtures. In order to permit the shutting off of either the coal range boiler or the instantaneous heater, gate valves *F* and *H* are installed. Valve *E* is a check to prevent water passing back through the heater. *G* is the gas line.

Fig. 3 shows the "reheat" system of connection. The water enters the boiler from the cold water supply line *A*, and after receiving there its initial heat, it passes, when a faucet is opened, through connection *C* into the heater, where it receives its final heat, and passes through connection *D* to the housepiping *B*, and the fixtures. *F* and *H* are gate valves,

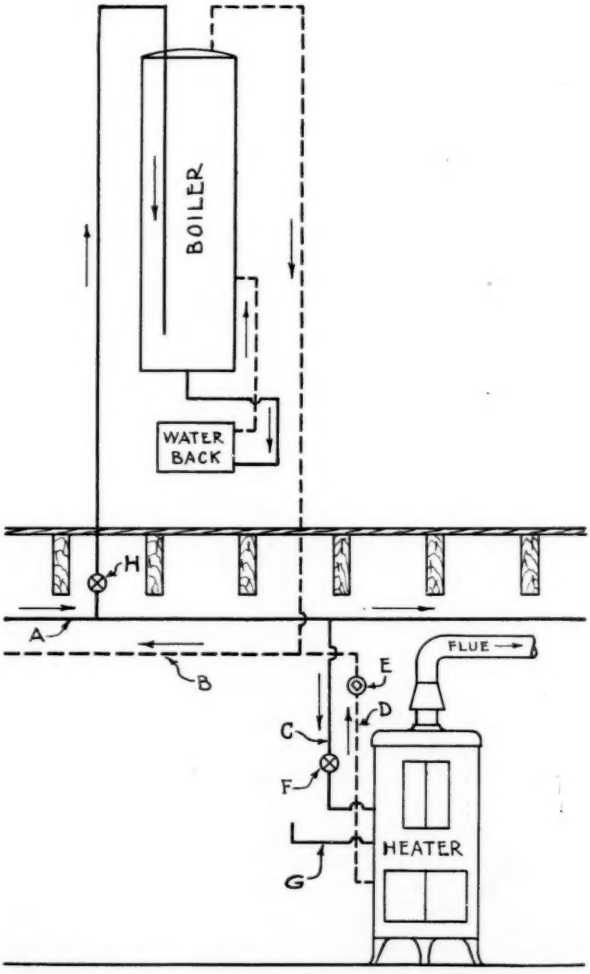


Fig. 2.—Automatic Instantaneous Water Heater Connection—Direct System.

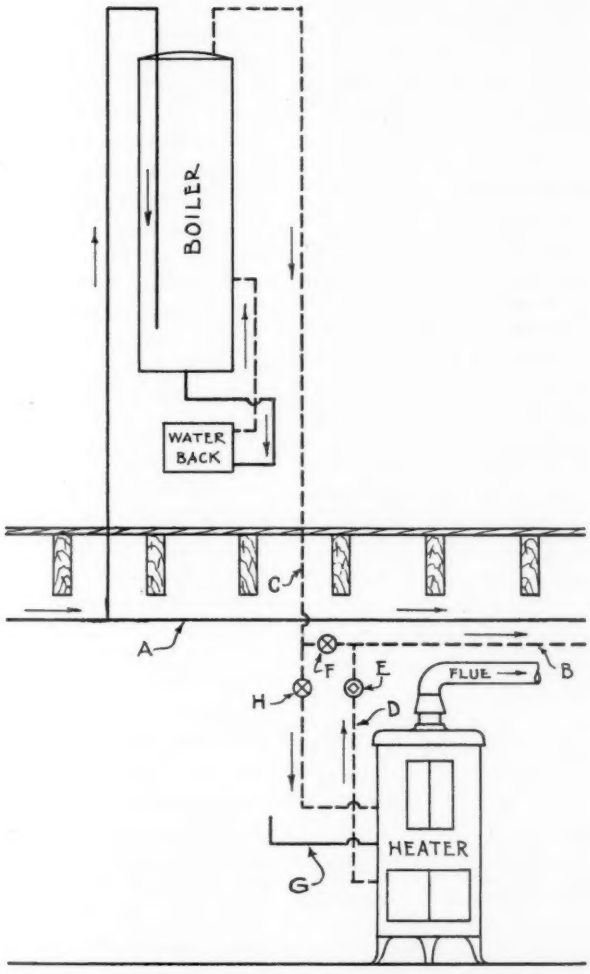


Fig. 3.—Automatic Instantaneous Water Heater Connection—Reheat System.

and *E* a check valve. To operate the boiler above, *H* should be closed, and *F* opened. To operate the heater and the boiler, *H* should be opened and *F* closed. Both *H* and *F* should not be open at the same time. The advantage of the "reheat" system lies in the reduction of the amount of gas necessary to raise the water to the temperature that will close the main gas valve.

When installing the water, gas, and flue connections, the principles explained under circulating heaters should be followed. The few rules below are applicable only to the automatic instantaneous heater.

Provide a firm foundation for the heater. A dirt floor is unsatisfactory.

Make a flue connection in every case.

Use self-closing faucets where hot water is most used.

Post instruction tags furnished by the heater manufacturer, in prominent places.

Make a careful test after completion, for operation of the pressure and thermal valve.

The sub-inspection of, and clean up after this work, involves the general principles described under "Cooking Appliances."

Maintenance.—Under usual conditions, a water heater will require less attention, comparatively speaking, than will a cooking appliance. A burner adjustment may be required because of dirt on the burner when the heater is in a very dusty location, or when a deposit, resulting from incomplete combustion, on the coils above the burner, drops down on to the burner. This of course is easily remedied. Gas leaks in burners should be repaired as described under "Cooking Appliances." Leaks in water piping, unless at unions, usually will require the renewal of the pipe. Leaks in the coil, or internal structure of the heater, never can be repaired on the consumer's premises, and unless the consumer is willing to have the defective part removed, and to wait the long time usually needed to determine whether or not a repair can be made at all, the best thing to do is to make a complete renewal at once.

The maintenance of a water heater involves attention to complaints concerning water circulation, and to water piping in general. Fortunately, complaints of insufficient hot water and of slow heating, are not frequent, but when these are due to causes other than poor burner adjustment, they are often difficult, and sometimes impossible, to remedy.

One of the most common "other" causes, is a stoppage in the water piping. The location of such a stoppage should be investigated as follows: When the cold water supply to the kitchen faucet is good, and to the hot water faucet poor, the stoppage is in the hot water branch to the kitchen. If under similar conditions of good cold water supply, the hot water flow is poor throughout the house, the stoppage probably is at the point of hot water take-off from the boiler. When the water does not circulate freely through the piping connections between the heater and the boiler, or when it backs down into the cold water connection, the stoppage is local in one of the connections. If it is in the cold connection, it may be remedied by drawing off the rust or dirt from the clean-out plug, but if it is in the hot connection, the piping must be taken down.

Another source of trouble that occurs with the circulating heater is "by-passing," so named because the heated water is prevented from circulating in the proper way, and either is forced to mix with cold water, or is passed by cold water when the hot faucet is opened. In some cases this is due to the absence of the boiler tube; in others, to stoppage which compels water, on its path to the faucet, to pass through the heater without being stored in the boiler. In either case the remedy is self-evident.

Rusty or muddy water may be remedied by allowing the heater to burn for about 30 minutes, and then quickly drawing off water from the clean-out plug; or it may necessitate taking down the whole boiler and its connections, and flushing it out in a thorough manner.

The principles just described apply also to the maintenance of heaters of the combination type.

The design of the automatic instantaneous heater is based on the idea of reducing visits for maintenance purposes to a minimum. This is accomplished in heaters of the best kinds. The burners of the heaters most commonly used are not capable of a gas and air adjustment, and practically the only trouble that

arises with them is the stopping up of the gauge with carbon or dust. This is easily removed, although sometimes it is necessary to renew the gauge. The amount of hot water, or its temperature, seldom are cause for complaint, but if so, the remedy may lie, in the former case, in removing a piping stoppage, and in the latter, in readjusting the thermostat control. The only other adjustments possible are some minor ones involving the gas and water valves, and practical experience is the best teacher for the performance of these. Any water leaks are practically always found in the copper coil. The repair should be cared for as explained for circulating heaters.

H. B. ANDERSEN.

(*Continued from page 139*)

people—among its customers, the small as well as the large. To quote the company: "We believe in this city—that is why we have invested over a million dollars here to supply gas and electric service; we believe in the future of Newburgh (and Poughkeepsie)—that is why we are constantly adding to our investment here. But we want a greater community, more industries, more homes, more people, more prosperity. We believe we can and do help community development by being ready to serve, not alone the retail, but the wholesale demand of present and prospective users of reliable gas and electric service at reasonable rates." The company in its advertisements in the *News* has always taken the public into its confidence. It wants the public's interest and support. It believes, and rightly, that by making the public largely the owner of the company it will gain in business and good will. Already its consumers own a majority of its shares of stock.

AMERICAN GAS ASSOCIATION.

List No. 27—March, 1919.

Rate Increases Secured.

Where information is not secured from company receiving increase, the source of information is noted in brackets. See Cumulative List of February 5, 1919, for explanation of abbreviations. This list includes only increases reported as secured subsequent to February 5, 1919.

ALABAMA

Gadsden: Tri-City Gas Co. reports old rate $1.50 per MCF, disc. 25¢ per M. Company asked for rate of $1.75 with disc. of 10%; P. S. C. granted a new rate of $1.65 per MCF less disc. of 10% 10 days, effective Feb. 10, 1919.

Mobile: Gas Co. reports P. U. C. granted increase effective Oct. 1, 1918. Old rate per MCF $1.20 gross, $1.10 net; new rate per MCF $1.45 gross, $1.35 net per M.

CALIFORNIA

Pittsburg: Contra Costa Gas Co. reports second increase effective Feb. 17, 1919. New rate: first 500 CF or less $1.10 gross, $1.00 net—next 2 MCF $1.75 gross, $1.65 net per M—next 2,500 CF $1.55 gross, $1.45 net per M—next 3 MCF $1.35 gross, $1.25 net—next 7 MCF $1.10 net—over 15 MCF $1.00 net per M. Net rates 10 days. P. P. Meters $1.75 per M. M. M. Chge. $1.00. Owner or lessee guarantees M. M. Chge. or any loss by theft, bad coins or plugs. Hotels, Restaurants, and Bakeries rate per MCF 90¢ gross, 85¢ net. M. W. Chge. per meter $7.50 gross, $7.00 net, if paid at office within 3 days after bill is rendered.

Los Angeles: L. A. G. & E. Corp. reports increase granted, effective March 1, 1919: 1st 5 MCF 75¢ per M—next 5 MCF 70¢—next 15 MCF 65¢—next 25 MCF 60¢—over 50 MCF 55¢. M. M. Chge. 35¢.

Rates for adjoining territory	District No. 2	District No. 3	District No. 4	M. M. Chge. each block
First 4 MCF	80¢	85¢	90¢	50¢
Next 6 MCF	70¢	75¢	80¢	50¢
Next 15 MCF	65¢	65¢	70¢	50¢
Next 25 MCF	60¢	60¢	60¢	50¢
Over 50 MCF	55¢	55¢	55¢	50¢

Cities and towns supplied—Pasadena, So. Pasadena, Huntington Park, Alhambra, San Marino, San Gabriel, Eagle Rock, Vernon, Watts, Inglewood, Monterey Park.

GEORGIA

Macon: Co. reports old rates: Gross rate $1.35 per MCF with discounts making net rates 1st 10 MCF $1.25 per M—next 10 MCF $1.15—next 10 MCF $1.05—all over 30 MCF 9¢ per MCF. In addition the following quantity discounts allowed: on gross bills $35 to $150 20%, $150 to $200 22.5%, $200 and over 25%; new rates effective Feb. 1, 1919: 1st 10 MCF $1.45 per M—next 20 MCF $1.30—next 20 MCF $1.20—next 50 MCF $1.10 per M—all over 100 MCF 85¢ per M; disct. 10¢ per M 10 days each block.

INDIANA

Aurora: Indiana Public Service Co., P. S. C. allows a surcharge of 25¢ per M. New rate: 1st 5 MCF $1.75 per M—over 5 MCF $1.25 per M; disct. both rates 25¢ per M. M. M. Chge. 50¢ per mo., old rate 25¢ per mo.

Franklin: Water, Light & Power Co., P. S. C. allows a surcharge of 25¢ per M, effective July 1, 1918, for war period not exceeding 2 years. New rate: 1st 5 MCF $1.35 per M—next 5 MCF $1.25—next 15 MCF $1.15—next 25 MCF $1.05—next 25 MCF 95¢—over 75 MCF 85¢ per M; disct. 10¢ per M. Old rates 25¢ per M less.

Shelbyville: Interstate Public Service Co. reports new rate effective Aug. 5, 1918: 1st 5 MCF $1.35 per M—next 5 MCF $1.25—next 15 MCF $1.15—next 25 MCF $1.05—next 25 MCF 95¢—all over 75 MCF 85¢ per M. Disct. 10¢ per M; M. M. Chge. 50¢ net per meter per mo. Old rate 25¢ per M each block.

IOWA

Dubuque: Key City Gas Co. reports Feb. 27, 1919, old rate $1.25 gross, $1.00 net per MCF on 1 MCF or over. Higher rate for less than 1 MCF. New rate effective July 1, 1918: $1.40 gross, $1.25 net per MCF, higher rates for less than 1 MCF. At end of 18 months period books to be audited. Net earnings in excess of 6% on capital stock and bonds to be returned to consumer.

MASSACHUSETTS

Cambridge: Company announces a voluntary reduction of 5¢ per MCF effective April 1, 1919.

Milford: Company reports third increase effective Feb. 1, 1919. New rate: 1st 10 MCF $2.20 per M—next 10 MCF $2.10—next 10 MCF $2.00—next 10 MCF $1.90—next 10 MCF $1.80 per M; disct. 10¢ per M each block; all over 50 MCF $1.60 net per M.

In granting this increase in dismissing the complaint, the Board used the following language:

"The critical fuel conditions encountered last winter, the energetic steps taken by the Fuel Administration to prevent its recurrence, and the uncertainty of the duration of the war placed the responsibility squarely upon the management to avoid any possibility of a failure of its service. It had the duty of using its best judgment with due regard to the exigencies of the occasion in obtaining supplies, and if that judgment is fairly exercised (even although changed conditions show that a different conclusion might have resulted in greater economy to the corporation), the operating cost resulting from this exercise of judgment is a proper charge to the consumer."

Palmer: Company reports third increase effective Aug. 1, 1918. New rate: 1st 2 MCF $2.60 gross, $2.50 net per M—3 MCF and over $2.50 gross, $2.40 net.

Woburn: Company reports third increase effective Aug. 20, 1918. New rate per MCF $2.00 gross, $1.85 net. Upon complaints two hearings were held; complaints dismissed without prejudice.

Worcester: Public hearing Jan. 13, 1919. Board ordered "that the price of gas sold and delivered be reduced on or before July 1, 1919, to $1.10 per MCF."

MONTANA

Billings: Gas Co. reports increase effective Feb. 1, 1919. Old rate: (Commercial) 1st 3 MCF $1.80 per M—next 2 MCF $1.60—next 10 MCF $1.50—next 15 MCF $1.35—over 30 MCF $1.25; disct. 10¢ per M each block; M. M. Chge. 50¢. (Industrial) 1st 5 MCF $1.10—next 10 MCF $1.00—next 15 MCF 90¢—next 30 MCF 80¢—next 40 MCF 75¢—over 100 MCF 7C¢; 10¢ disct. each block.

New rate: (Commercial) 1st 3 MCF $1.95—next 2 MCF $1.75—next 10 MCF $1.65—next 15 MCF $1.50—over 30 MCF $1.30 per M; disct. 10¢ per M each block; M. M. Chge. 75¢. (Industrial) 1st 5 MCF $1.60—next 10 MCF $1.50—next 15 MCF $1.40—next 30 MCF $1.30—next 40 MCF $1.25—over 100 MCF $1.20 per M— disct. 10¢ per M each block.

NEBRASKA

Beatrice: Company reports second increase effective Oct. 1, 1918. New rate: $1.80 gross, $1.75 net per MCF.

NEW JERSEY

Bridgeton: Co. reports second increase effective Feb. 18, 1919. New rates: 1st 25 MCF $1.30 per M—next 25 MCF $1.25—next 25 MCF $1.20—next 25 MCF $1.15 per M.

NEW YORK

Olean: Keystone Gas Co. (Natural) reports second increase effective Feb. 13, 1919. Old rate per MCF 42¢ gross, 40¢ net per M. New rate 47¢ gross, 45¢ net.

OHIO

Medina: Gas & Fuel Co. (Natural), Subsidiary of Central Ohio G. & E. Co., reports old rate per MCF 28¢ gross, 25¢ net. New rate per MCF 38¢ gross, 35¢ net. These rates also apply to the following cities and towns under same control effective at dates shown: Leroy, July 18; Seville, Aug. 1; Lodi, July 24; Creston, July 17; Burbank, July 26; West Salem, July 21; all 1918. Medina, Jan. 10, 1919. Venture Gas Co., Nevada, effective Dec. 4, 1918: 1st 25 MCF 50¢ net—next 5 MCF 60¢ net—all over 30 MCF 70¢ net per M. Morrall same rates effective Oct. 16, 1918; Mt. Victory, Nov. 1, 1918; Harpster, Nov. 7, 1918. All Ohio companies and under same control.

OKLAHOMA

McAlester: Gas & Coke Co. (Natural) reports old rate per MCF 35¢ gross, 31½¢ net. (Industrial) 10¢ net per M. New rates effective Oct. 1, 1918: 1st 200 MCF 35¢—next 200 MCF 27.45¢—next 200 MCF 24.45¢—next 200 MCF 23.8¢—next 200 MCF 22.5¢—next 1,000 MCF 20.66¢—next 3,000 MCF 18.1¢—next 5,000 MCF 16.66¢—next 5,000 MCF 16.11¢—all excess 15.9¢—disct. each block 10%. Supplies also Blocker and Featherston.

Ada: McThwaite Oil & Gas Co. (Natural) reports increase effective Nov. 1, 1918. Old rate: (Domestic) 25¢ per MCF; (Factory) 8¢ to 20¢ Per M, as per contract. New rate: 1st 100 MCF 35¢ per M—next 100 MCF 30¢—next 100 MCF 25¢—next 200 MCF 20¢—next 500 MCF 17½¢—all excess of 1,000 MCF monthly 15¢ per M.

PENNSYLVANIA

Butler: F. W. Phillips Gas & Oil Co. (Natural) reports old rate: Class I, (Domestic) consumers 30¢ gross, 27½¢ net, 10 days per MCF. New rate effective Sept. 20, 1918: 37¢ gross, 35¢ net, 10 days per MCF. R. T. S. Chge. 25¢ per mo. Class II, (Industrial) and large consumers, old rate: 1st 500 MCF 31¢ per M—next 500 MCF 26¢ per M—all in excess of 1,000 MCF 25¢ per M—disct. 1¢ per M all bills 10 days. New rate effective Aug. 31, 1918: 1st 500 MCF 36¢ per M—next 500 MCF 31¢ per M—all over 1,000 MCF 3C¢ per M—disct. 1¢ per M 10 days. All gas based on pressure 8 oz.—higher pressure corrected to Boyle's Law.

Pittsburgh: American Natural Gas Co. reports increase effective Oct. 16, 1918. Old rate: (Domestic) 32¢ per MCF—disct. 2¢ per M. (Industrial) 1st 500 MCF 31¢ per M—all thereafter 28¢ per M—disct. 1¢ per M. New rate: (Domestic) 37¢ per M—disct. 2¢ per M, plus R. T. S. Chge. 25¢ per mo. (Industrial) 1st 500 MCF 36¢ per M—all thereafter 31¢ per M—disct. 1¢ per M.

RHODE ISLAND

Bristol: Bristol County G. & E. Co. reports new rate: S. Chge. $6.00 per year, gas rate $1.20 per MCF. This rate after July 1, 1919, controlled by a coal clause which will increase or decrease by fluctuations in price of coal to Providence Gas Co. above or below $3.30 per ton and in price of oil above or below 4½¢ per gal. Fluctuation due to coal is 1¢ per M for each 18¢ change and 2¢ per M for each 1¢ in price of oil above or below 4½¢. Discontinued rate $1.40 per MCF, disct. 10¢ per M 10 days. Supplies Bristol and Warren.

WISCONSIN

Oshkosh: Co. reports old rate: 1st 15 MCF $1.25 per M—next 35 MCF $1.15—all over 50 MCF $1.00—disct. 25¢ per M each block—M. M. Chge. 50¢ per mo—3-lt. meter 50¢—5-lt. 50¢—10-lt. 60¢—20-lt. 60¢—30-lt. 75¢—45-lt. 85¢—60-lt. $1.00—80-lt. $1.50—100-lt. $2.00—200-lt. $4.00. New rate effective April 1, 1919: 1st 15 MCF $1.50 per M—next 35 MCF $1.40—all over 50 MCF $1.25 per M—disct. 25¢ per M each block—M. M. Chge. unchanged.

Portage: American Gas Co. reports increase allowed Jan. 1, 1919. New rate: 1st 2 MCF $1.60 per M—next 3 MCF $1.50—next 5 MCF $1.40—next 10 MCF $1.30—all over 20 MCF $1.20 per M—disct. each block 10¢ per M. Old rates each block 20¢ less per M. M. M. Chge. 25¢ per mo. per 3 and 5-lt. meters.

Stevens Point: Wisconsin Valley Electric Co. reports increase effective March 1, 1918. Old rate: (Lighting) per MCF $2.00 gross, $1.75 net; (Heating) $1.50 gross, $1.25 net. New rate: 1st MCF $2.00—next 2 MCF $1.85 per M—next 7 MCF $1.65 per M—all over 10 MCF $1.40 per M. If consumer is delinquent 25¢ penalty is added to bill. If delinquent both gas and electricity 25¢ penalty is added to combined bill.

Watertown: Second increase granted effective Oct. 31, 1918. New rate: 1st MCF $1.80 gross, $1.70 net—next 4 MCF $1.65 gross, $1.55 net—next 5 MCF $1.40 gross, $1.30 net—next 5 MCF $1.30 gross, $1.20 net—over 15 MCF $1.20 gross, $1.10 net per M.

Wausau: Second increase granted effective Jan. 1, 1919. New rates: M. M. Chge. 75¢ net—1st 5 MCF $1.70 gross, $1.60 net—next 5 MCF $1.50 gross, $1.40 net—next 10 MCF $1.30 gross, $1.20 net—all over 20 MCF $1.10 gross, $1.00 net per M.

CANADA

Winnipeg: Electric Railway Co. reports first increase effective July, 1917. Old rate: $1.50 per MCF—20% disct. 10 days. New rate: $1.50 per MCF—10% disct. 10 days. Second increase effective June, 1918: $1.50 net per MCF, P. P. Meters only.

Silica Refractories, Factors Affecting their Quality and Methods of Testing the Raw Materials and Finished Ware

TECHNICAL PAPER 116, Bureau of Standards; abstract in *Journal of the Franklin Institute,* 187, 353 (March, 1919).

The relative position of the specific gravity between 2.65 (that of quartz) and 2.27 (that of tridymite) in conjunction with the porosity indicates approximately the subsequent expansion of the brick in use. Specific gravity and porosities of most of the leading varieties of silica brick have been determined. Expansion of silica brick in by-product coke ovens and gas benches results from transformation of quartz to the less dense tridymite, counteracted more or less by the drawing together of the particles of the brick.

Classified Directory--Manufacturers of Gas Equipment

Company Members Only, American Gas Association

AMMONIUM SULPHATE PLANTS
The Bartlett Hayward Co., Baltimore, Md.

ARC LAMPS (Gas)
General Gas Light Co., New York, N. Y., and Kalamazoo, Mich.
Welsbach Co., Gloucester, N. J.

BENCH IRON WORK
Gas Machinery Co., Cleveland, Ohio
The Bartlett Hayward Co., Baltimore, Md.
The Improved Equipment Co., 60 Wall St., New York, N. Y.
The Parker-Russell Mining & Mfg. Co., St. Louis, Mo.
The Stacey Mfg. Co., Cincinnati, Ohio

BENZOL RECOVERY APPARATUS
The Bartlett Hayward Co., Baltimore, Md.

BOILERS (Gas)
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
General Gas Appliance Co., 103 Park Ave., New York, N. Y.
Kidde & Co., 169 Chambers St., New York, N. Y.
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.

BOILERS (Gas for House Heating)
Kidde & Co., 169 Chambers St., New York, N. Y.

BOILERS (Waste Heat)
The Bartlett Hayward Co., Baltimore, Md.

BLOWERS, BOOSTERS, EXHAUSTERS
Gas Machinery Co., Cleveland, Ohio
C. M. Kemp Mfg. Co., Baltimore, Md.
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.

BRAZING TABLES
Rathbone, Sard & Co., Albany, N. Y.
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.

BROILERS (Hotel)
Rathbone, Sard & Co., Albany, N. Y.
The Michigan Stove Co., Detroit, Mich.

BURNERS (Industrial)
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Equitable Meter Co., Pittsburgh, Pa.
General Fire Extinguisher Co., Providence, R. I.
General Gas Appliance Co., 103 Park Ave., New York, N. Y.
C. M. Kemp Mfg. Co., Baltimore, Md.
The Baltimore Gas Appliance & Mfg. Co., Baltimore, Md.
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.

BURNERS (Lighting)
American Meter Co., Inc., 105 W. 40th St., New York, N. Y.
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
General Gas Light Co., New York, N. Y., and Kalamazoo, Mich.
Lindsay Light Co., New York, N. Y., and Chicago, Ill.
Welsbach Co., Gloucester, N. J.

BY-PRODUCT OVENS
The Parker-Russell Mining & Mfg. Co., St. Louis, Mo.

BY-PRODUCT RECOVERY APPARATUS
Gas Machinery Co., Cleveland, Ohio
Isbell-Porter Co., Newark, N. J.
The Bartlett Hayward Co., Baltimore, Md.

CALORIMETERS
American Meter Co., Inc., 105 W. 40th St., New York, N. Y.
Maryland Meter Works, Baltimore, Md.
Nathaniel Tufts Meter Works, 455 Commercial St., Boston, Mass.

CAKE GRIDDLES
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.

CAULKING TOOLS
H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.
United Lead Co., 111 Broadway, New York, N. Y.

CHARGING COAL
Gas Machinery Co., Cleveland, Ohio
The Bartlett Hayward Co., Baltimore, Md.

COCKS (Ranges, Water Heaters, Service and Meter)
Hays Mfg. Co., Erie, Pa.
H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.
Standard Brass Works, Detroit, Mich.
The Roberts Brass Mfg. Co., Detroit, Mich.

COKE SCREENING PLANTS
The Bartlett Hayward Co., Baltimore, Md.

COMPRESSORS
C. M. Kemp Mfg. Co., Baltimore, Md.
The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.

CONFECTIONERS' STOVES (Gas)
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.

CONDENSERS
Camden Iron Works, Camden, N. J.
Cruse-Kemper Co., Ambler, Pa.
Gas Machinery Co., Cleveland, Ohio
Isbell-Porter Co., Newark, N. J.
The Bartlett Hayward Co., Baltimore, Md.
The Stacey Mfg. Co., Cincinnati, Ohio
The Stacey Bros. Gas Construction Co., Cincinnati, Ohio
Steere Engineering Co., Detroit, Mich.

CONVEYORS (Coal and Coke)
The Bartlett Hayward Co., Baltimore, Md.

COUPLINGS
S. R. Dresser Mfg. Co., Bradford, Pa.

CRUSHERS (Coal and Coke)
The Bartlett Hayward Co., Baltimore, Md.

DECALCOMANIA PRODUCTS
The Meyercord Co., Inc., Chamber of Commerce Bldg., Chicago, Ill.

DOUGHNUT AND CRULLER FRYERS
The G. S. Blodgett Co., Burlington, Vt.

ENGINEERS
The Bartlett Hayward Co., Baltimore, Md.
Steere Eng. Co., Detroit, Mich.

ENGINES (Gas)
The Bartlett Hayward Co., Baltimore, Md.
United Lead Co., 111 Broadway, New York, N. Y.

EXCHANGERS (Heat)
The Bartlett Hayward Co., Baltimore, Md.

EXPERT APPRAISAL
Steere Engineering Co., Detroit, Mich.

EXTRACTORS (Tar, Dust, Fumes)
The Bartlett Hayward Co., Baltimore, Md.

FITTINGS
Will W. Barnes, 31 Chelsea Place, East Orange, N. J.
S. R. Dresser Mfg. Co., Bradford, Pa.
Eriez Stove & Mfg. Co., Erie, Pa.
Gas Machinery Co., Cleveland, Ohio
General Fire Extinguisher Co., Providence, R. I.
H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.
Shapiro & Aronson, Inc., 20 Warren St., New York, N. Y.
Standard Brass Works, Detroit, Mich.
The Roberts Brass Mfg. Co., Detroit, Mich.
Welsbach Co., Gloucester, N. J.

FLEXIBLE TUBING
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Titeflex Metal Hose Corp., Badger Ave., Newark, N. J.

FLASHLIGHTS AND BATTERIES
Will W. Barnes, 31 Chelsea Place, East Orange, N. J.

FUEL BRIQUETTING
General Briquetting Co., 25 Broad St., New York, N. Y.

FURNACES
Eriez Stove & Mfg. Co., Erie, Pa.
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
The Parker-Russell Mining & Mfg. Co., St. Louis, Mo.
The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.

GAS ENGINE COCKS AND VALVES
Standard Brass Works, Detroit, Mich.

GAS IRONS
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Strauss Gas Iron Co., Philadelphia, Pa.

GAS LOGS
The Mead Gas Heater Co., Delawanna, N. J.

GAS MIXERS
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Eriez Stove & Mfg. Co., Erie, Pa.
General Fire Extinguisher Co., Providence, R. I.
Hays Mfg. Co., Erie, Pa.
Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
C. M. Kemp Mfg. Co., Baltimore, Md.
The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.

GAS PLANTS (Blue)
The Bartlett Hayward Co., Baltimore, Md.

GAS PLANTS (Coal)
Camden Iron Works, Camden, N. J.
Gas Machinery Co., Cleveland, Ohio
Isbell-Porter Co., Newark, N. J.
The Bartlett Hayward Co., Baltimore, Md.
The Improved Equipment Co., 60 Wall St., New York, N. Y.
The Parker-Russell Mining & Mfg. Co., St. Louis, Mo.
The Stacey Mfg. Co., Cincinnati, Ohio
The Stacey Bros. Gas Construction Co., Cincinnati, Ohio
Steere Engineering Co., Detroit, Mich.

GAS PLANTS (Carbureted Water)
Gas Machinery Co., Cleveland, Ohio
The Bartlett Hayward Co., Baltimore, Md.
The Improved Equipment Co., 60 Wall St., New York, N. Y.
The Stacey Mfg. Co., Cincinnati, Ohio

HEATERS (Room)
American Stove Co., St. Louis, Mo.
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Detroit Stove Works, Detroit, Mich.
Eclipse Gas Stove Co., Rockford, Ill.
Eriez Stove & Mfg. Co., Erie, Pa.
General Fire Extinguisher Co., Providence, R. I.
General Gas Light Co., New York, N. Y., and Kalamazoo, Mich.
Kidde & Co., 169 Chambers St., New York, N. Y.
Lawson Mfg. Co., Pittsburgh, Pa.
Roberts & Mander Stove Co., Philadelphia, Pa.
The Baltimore Gas Appliance & Mfg. Co., Baltimore, Md.
The Mead Gas Heater Co., Delawanna, N. J.

HEATERS (Fireplace)
General Gas Light Co., New York, N. Y., and Kalamazoo, Mich.
The Mead Gas Heater Co., Delawanna, N. J.

HEATERS (Garage)
Kidde & Co., 169 Chambers St., New York, N. Y.

HEATERS (Soldering Irons)
American Stove Co., St. Louis, Mo.
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Eclipse Gas Stove Co., Rockford, Ill.
General Gas Appliance Co., 103 Park Ave., New York, N. Y.
Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.

HEATERS (Pressing Irons)
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.

HIGH PRESSURE SYSTEMS
Gas Machinery Co., Cleveland, Ohio
General Fire Extinguisher Co., Providence, R. I.
C. M. Kemp Mfg. Co., Baltimore, Md.
H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.
The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.

HOLDERS
Camden Iron Works, Camden, N. J.
Cruse-Kemper Co., Ambler, Pa.
The Bartlett Hayward Co., Baltimore, Md.
The Stacey Mfg. Co., Cincinnati, Ohio
The Stacey Bros. Gas Construction Co., Cincinnati, Ohio

HOT PLATES
American Stove Co., St. Louis, Mo.
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Detroit Stove Works, Detroit, Mich.
Eclipse Gas Stove Co., Rockford, Ill.
Eriez Stove & Mfg. Co., Erie, Pa.
Rathbone, Sard & Co., Albany, N. Y.
The Baltimore Gas Appliance & Mfg. Co., Baltimore, Md.
The Michigan Stove Co., Detroit, Mich.
Union Stove Works, 20 Beekman St., New York, N. Y.

IRON WORK (General)
The Stacey Mfg. Co., Cincinnati, Ohio

INCINERATORS
Ruud Mfg. Co., Pittsburgh, Pa.

INSTRUMENTS (Measuring, Testing and Recording)
American Meter Co., 105 W. 40th St., New York, N. Y.
Equitable Meter Co., Pittsburgh, Pa.
Maryland Meter Works, Baltimore, Md.
Steere Engineering Co., Detroit, Mich.

KILNS (For Firing Glass, China and Pottery)
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
The Parker-Russell Mining & Mfg. Co., St. Louis, Mo.
The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.

LAUNDRY AND TAILOR STOVES (Gas)
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.

LIGHTERS (Hand)
Welsbach Co., Gloucester, N. J.

LIGHTERS (Ranges)
- Safety Gas Lighter Co., Haverhill, Mass.
- Strauss Gas Iron Co., Philadelphia, Pa.
- The Michigan Stove Co., Detroit, Mich.

LIGHTING (Gas Domes)
- Will W. Barnes, 31 Chelsea Place, East Orange, N. J.
- Kramer Bros. Lamp Co., 585 Broadway, New York, N. Y.
- Shapiro & Aronson, Inc., 20 Warren St., New York, N. Y.
- Welsbach Co., Gloucester, N. J.

LIGHTING (Fixtures)
- Will W. Barnes, 31 Chelsea Place, East Orange, N. J.
- Shapiro & Aronson, Inc., 20 Warren St., New York, N. Y.
- Welsbach Co., Gloucester, N. J.

LIGHTING (Mantles)
- General Gas Light Co., New York, N. Y., and Kalamazoo, Mich.
- Lindsay Light Co., New York, N. Y., and Chicago, Ill.
- Welsbach Co., Gloucester, N. J.

LIGHTING (Portables)
- Will W. Barnes, 31 Chelsea Place, East Orange, N. J.
- Kramer Bros. Lamp Co., 585 Broadway, New York, N. Y.
- Shapiro & Aronson, Inc., 20 Warren St., New York, N. Y.
- Welsbach Co., Gloucester, N. J.

LIGHTING (Glassware)
- Shapiro & Aronson, Inc., 20 Warren St., New York, N. Y.
- Welsbach Co., Gloucester, N. J.

METAL RECEPTACLES
- Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
- The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
- The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.
- United Lead Co., 111 Broadway, New York, N. Y.

METERS
- American Meter Co., 105 W. 40th St., New York, N. Y.
- Cleveland Gas Meter Co., Cleveland, Ohio
- Equitable Meter Co., Pittsburgh, Pa.
- Maryland Meter Works, Baltimore, Md.
- Superior Meter Co., Bush Terminal, Brooklyn, N. Y.
- The Cleveland Rotary Meter Co., Cleveland, Ohio
- The Sprague Meter Co., Bridgeport, Conn.
- Nathaniel Tufts Meter Works, 455 Commercial St., Boston, Mass.

METER CONNECTIONS
- American Meter Co., 105 W. 40th St., New York, N. Y.
- Cleveland Gas Meter Co., Cleveland, Ohio
- S. R. Dresser Mfg. Co., Bradford, Pa.
- H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.
- Superior Meter Co., Bush Terminal, Brooklyn, N. Y.
- The Lattimer Stevens Co., Columbus, Ohio
- The Sprague Meter Co., Bridgeport, Conn.
- Nathaniel Tufts Meter Works, 455 Commercial St., Boston, Mass.

METER PROVERS
- American Meter Co., 105 W. 40th St., New York, N. Y.
- Equitable Meter Co., Pittsburgh, Pa.
- Maryland Meter Works, Baltimore, Md.
- Superior Meter Co., Bush Terminal, Brooklyn, N. Y.
- Nathaniel Tufts Meter Works, 455 Commercial St., Boston, Mass.

METER SHELF
- Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.

METAL SEALS
- American Meter Co., 105 W. 40th St., New York, N. Y.
- Equitable Meter Co., Pittsburgh, Pa.
- H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.
- The Lattimer Stevens Co., Columbus, Ohio

OVENS (Baking and Cooking)
- The G. S. Blodgett Co., Burlington, Vt.
- Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
- Eclipse Gas Stove Co., Rockford, Ill.
- General Fire Extinguisher Co., Providence, R. I.
- General Gas Appliance Co., 103 Park Ave., New York, N. Y.
- The Crandall-Pettee Co., Hudson St., New York, N. Y.
- The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
- The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.

OVENS (Annealing and Japanning)
- Gehnrich Indirect Heat Oven Co., Inc., 62 Franklin Ave., Brooklyn, N. Y.
- General Fire Extinguisher Co., Providence, R. I.
- General Gas Appliance Co., 103 Park Ave., New York, N. Y.
- C. M. Kemp Mfg. Co., Baltimore, Md.
- The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
- The Surface Combustion Co., 366 Gerard Ave., New York, N. Y.

OVENS (Warming)

The G. S. Blodgett Co., Burlington, Vt.
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Eclipse Gas Stove Co., Rockford, Ill.
General Gas Appliance Co., 103 Park Ave., New York, N. Y.
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.

PHOTOMETERS

American Meter Co., 105 W. 40th St., New York, N. Y.
Maryland Meter Works, Baltimore, Md.
Nathaniel Tufts Meter Works, Boston, Mass.

PIPE

Camden Iron Works, Camden, N. J.
General Fire Extinguisher Co., Providence, R. I.
Steere Engineering Co., Detroit, Mich.
The Bartlett Hayward Co., Baltimore, Md.
United Lead Co., 111 Broadway, New York, N. Y.

PIPE CASTINGS AND SPECIALS

The Bartlett Hayward Co., Baltimore, Md.
The Stacey Mfg. Co., Cincinnati, Ohio

PIPE CUTTING APPLIANCES

General Fire Extinguisher Co., Providence, R. I.

PIPE CLAMPS AND SLEEVES

S. R. Dresser Mfg. Co., Bradford, Pa.

PIPE PACKING

General Fire Extinguisher Co., Providence, R. I.
United Lead Co., 111 Broadway, New York, N. Y.

PIPE TAPPING TOOLS

General Fire Extinguisher Co., Providence, R. I.
H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.
United Lead Co., 111 Broadway, New York, N. Y.

PLATE WARMERS

Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
General Gas Appliance Co., 103 Park Ave., New York, N. Y.
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.

PORCELAIN ENAMEL PARTS
(Stoves, Lamps, Linings, Stamping and Spinnings)

Eclipse Gas Stove Co., Rockford, Ill.
Baltimore Enamel & Novelty Co., Baltimore, Md.

PRESSURE GAUGES

American Meter Co., 105 W. 40th St., New York, N. Y.
Equitable Meter Co., Pittsburgh, Pa.
Gas Machinery Co., Cleveland, Ohio
General Fire Extinguisher Co., Providence, R. I.
Maryland Meter Works, Baltimore, Md.
Superior Meter Co., Bush Terminal, Brooklyn, N. Y.
The Cleveland Rotary Meter Co., Cleveland, Ohio.
Nathaniel Tufts Meter Works, Boston, Mass.

PUMPS

American Meter Co., 105 W. 40th St., New York, N. Y.
Gas Machinery Co., Cleveland, Ohio
Nathaniel Tufts Meter Works, Boston, Mass.

PURIFIERS

Camden Iron Works, Camden, N. J.
Cruse-Kemper Co., Ambler, Pa.
Gas Machinery Co., Cleveland, Ohio
Isbell-Porter Co., Newark, N. J.
Steere Engineering Co., Detroit, Mich.
The Bartlett Hayward Co., Baltimore, Md.
The Improved Equipment Co., 60 Wall St., New York, N. Y.
The Stacey Bros. Gas Construction Co., Cincinnati, Ohio
The Stacey Mfg. Co., Cincinnati, Ohio

RADIATORS

James B. Clow & Sons, Chicago, Ill.
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Eriez Stove & Mfg. Co., Erie, Pa.
General Fire Extinguisher Co., Providence, R. I.
Kidde & Co., 169 Chambers St., New York, N. Y.
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
The Mead Gas Heater Co., Delawanna, N. J.

RANGES (Domestic)

American Stove Co., St. Louis, Mo.
Comstock-Castle Stove Co., Quincy, Ill.
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Detroit Stove Works, Detroit, Mich.
Eclipse Gas Stove Co., Rockford, Ill.
Eriez Stove & Mfg. Co., Erie, Pa.
General Gas Appliance Co., 103 Park Ave., New York, N. Y.
Rathbone, Sard & Co., Albany, N. Y.
Roberts & Mander Stove Co., Philadelphia. Pa.
The Baltimore Gas Appliance & Mfg. Co., Baltimore, Md.

The Michigan Stove Co., Detroit, Mich.
The Peninsular Stove Co., Detroit, Mich.
Union Stove Works, 70 Beekman St., New York, N. Y.
Vesta Gas Range & Mfg. Co., Chattanooga, Tenn.

RANGES (Hotel)

American Stove Co., St. Louis, Mo.
Comstock-Castle Stove Co., Quincy, Ill.
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Detroit Stove Works, Detroit, Mich.
Eclipse Gas Stove Co., Rockford, Ill.
Roberts & Mander Stove Co., Philadelphia, Pa.
The Baltimore Gas Appliance & Mfg. Co., Baltimore, Md.
The Michigan Stove Co., Detroit, Mich.

REFRACTORY MATERIALS

Gas Machinery Co., Cleveland, Ohio
Harbison-Walker Refractories Co., Pittsburgh, Pa.
The Improved Equipment Co., 60 Wall St., New York, N. Y.
The Parker-Russell Mining & Mfg. Co., St. Louis, Mo.

REGULATORS (Governors)

American Meter Co., 105 W. 40th St., New York, N. Y.
Equitable Meter Co., Pittsburgh, Pa.
Gas Machinery Co., Cleveland, Ohio
H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.
Steere Engineering Co., Detroit, Mich.
The Improved Equipment Co., 60 Wall St., New York, N. Y.
The Cleveland Rotary Meter Co., Cleveland, Ohio
The Sprague Meter Co., Bridgeport, Conn.

REPAIRS (Gas Meters and Appliances)

Maryland Meter Works, Baltimore, Md.

RETORTS

Gas Machinery Co., Cleveland, Ohio
Harbison-Walker Refractories Co., Pittsburgh, Pa.
The Parker-Russell Mining & Mfg. Co., St. Louis, Mo.

SCRUBBERS

Camden Iron Works, Camden, N. J.
Gas Machinery Co., Cleveland, Ohio
Isbell-Porter Co., Newark, N. J.
Steere Engineering Co., Detroit, Mich.
The Bartlett Hayward Co., Baltimore, Md.
The Improved Equipment Co., 60 Wall St., New York, N. Y.
The Stacey Bros. Gas Construction Co., Cincinnati, Ohio
The Stacey Mfg. Co., Cincinnati, Ohio

SERVICE BOXES

Camden Iron Works, Camden, N. J.
General Fire Extinguisher Co., Providence, R. I.
Hays Mfg. Co., Erie, Pa.
H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.

SERVICE CLAMPS

H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.

STRUCTURAL STEEL WORKS

Camden Iron Works, Camden, N. J.
Cruse-Kemper Co., Ambler, Pa.
The Stacey Bros. Gas Construction Co, Cincinnati, Ohio
The Stacey Mfg. Co., Cincinnati, Ohio

TANKS (Ammonia, Oil, Water)

Camden Iron Works, Camden, N. J.
Cruse-Kemper Co., Ambler, Pa.
Gas Machinery Co., Cleveland, Ohio
Steere Engineering Co., Cincinnati, Ohio
The Bartlett Hayward Co., Baltimore, Md.
The Stacey Bros. Gas Construction Co., Cincinnati, Ohio
The Stacey Mfg. Co., Cincinnati, Ohio

TAPPING MACHINES

H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.

THERMOMETERS

American Meter Co., 105 W. 40th St., New York, N. Y.
Gas Machinery Co., Cleveland, Ohio
General Fire Extinguisher Co., Providence, R. I.
Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.

THERMOSTATS

Gas Machinery Co., Cleveland, Ohio
Kidde & Co., 169 Chambers St., New York, N. Y.
B. Ryan & Co., 60 E. 10th St., New York, N. Y.

THERMO VALVES

Pittsburgh Water Heater Co., Pittsburgh, Pa.

THORIUM

Welsbach Co., Gloucester City, N. J.

VALVES

Gas Machinery Co., Cleveland, Ohio
General Fire Extinguisher Co., Providence, R. I.
Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
Improved Equipment Co., 60 Wall St., New York, N. Y.
Isbell-Porter Co., Newark, N. J.
Steere Engineering Co., Detroit, Mich.

WATER HEATERS

Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Detroit Stove Works, Detroit, Mich.
Eclipse Gas Stove Co., Rockford, Ill.
General Gas Appliance Co., 103 Park Ave., New York, N. Y.
Humphrey Co., Kalamazoo, Mich.
Kidde & Co., 169 Chambers St., New York, N. Y.
Lawson Mfg. Co., Pittsburgh, Pa.
Peninsular Stove Co., Detroit, Mich.
Philadelphia Stove Co., Philadelphia, Pa.
Pittsburgh Water Heater Co., Pittsburgh, Pa.
Rathbone, Sard & Co., Albany, N. Y.
Ruud Mfg. Co., Pittsburgh, Pa.
The Baltimore Gas Appliance & Mfg. Co., Baltimore, Md.
The Hoffman Heater Co., Lorain, Ohio
The Michigan Stove Co., Detroit, Mich.

WELDED STEEL PIPE

The Bartlett Hayward Co., Baltimore, Md.
Steere Engineering Co., Detroit, Mich.

Institution of Gas Engineers

The Institution of Gas Engineers (Inc.) of Westminster, London, has extended, through its Secretary, Mr. Walter T. Dunn, F. C. I. S., to the members of the American Gas Association, a hearty invitation to participate in the Annual General Meeting of the Society which will be held at the Institution of Civil Engineers, in London, from Tuesday to Thursday, May 27-29, under the presidency of Mr. Samuel Glover, of St. Helens.

Toledo Joint Company Section

The Toledo Joint Company Section of Toledo, Ohio, held an interesting program on March 4, 1919. The paper of the evening was read by Mr. E. R. Kelsey, who gave a summary of the Section's program of activities. A membership contest, started in January, resulted in the acquisition of 762 new members. A series of five prizes is being offered for the five longest lists of new members secured before May 1, 1919.

Bulletin of Abstracts

The American Gas Association is carrying on this very useful service of culling the important items from the gas journals of America and Europe, condensing and classifying them for the use and files of the busy executive. Published bi-monthly, on heavy 5x8" paper, loose-leaf, indexed.

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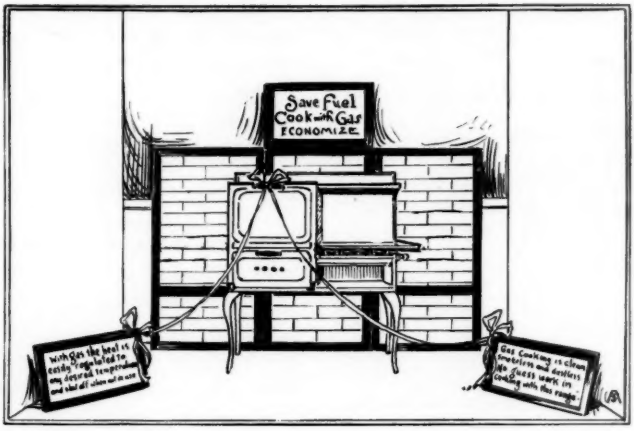

Adjustable Screen in Use

The February MONTHLY (page 58) showed a diagram of a three-section screen built to meet the needs of the gas display man in decorating his windows or setting up special displays on the salesroom floor.

This photograph, taken from the first issue of the Window Display Service (Free to Company Members—$25 per year to non-members) shows the screen in use. Two panels of each section have been covered with tiled paper—merely remove panel, insert paper, replace panel and turn the button to hold it in place. No paste, no tacks. Two of the top panels in their frames here form signs.

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BIBLIOGRAPHY OF GAS LITERATURE

In this Bibliography are listed articles of interest to the gas industry.

References are frequently made to the following publications:

Gas Trade Journals—American.

Am. G. E. Jour.—American Gas Engineering Journal (American Gas Light Journal, Inc., 42 Pine St., New York, N. Y.).
The Gas Age—Progressive Age Publishing Co. (52 Vanderbilt Ave., New York, N. Y.).
Gas Industry—The Periodicals Publishing Co., Inc. (Buffalo, N. Y.).
Gas Record (20 W. Jackson Blvd., Chicago, Ill.).
Int. G. Jour. of Canada—Intercolonial Gas Journal of Canada (90 Caroline St., N. Hamilton, Canada).
Jour. Acet. Ltg.—Journal of Acetylene Lighting (Acetylene Journal Publishing Co., Peoples Gas Bldg., Chicago, Ill.).
Natural Gas and Gasoline Journal—The Periodicals Publishing Co., Inc. (Buffalo, N. Y.).

Gas Trade Journals—English.

Gas Jour.—Gas Journal (Walter King, Publisher, 11 Bolt Court, Fleet St., London, E. C.).
The Gas World (John Allen & Co., 8 Bouverie St., London, E. C. 4).

Association Bulletins.

Bulletin B. C. G. A.—British Commercial Gas Association (47 Victoria St., Westminster, London, S. W.).
Bulletin Empire State Gas & Electric Association (29 W. 39th St., New York, N. Y.).
N. E. L. A. Bulletin—National Electric Light Association (29 W. 39th St., New York, N. Y.).
Trans. I. E. S.—Illuminating Engineering Society (29 W. 39th St., New York, N. Y.).
Jour. R. Soc. of Arts—Journal of the Royal Society of Arts (John St., Adelphi, London, W. C. 2).
A Thousand and One Uses for Gas (British Commercial Gas Association, 47 Victoria St., Westminster, London, S. W., England).

House Organs.

Advance Club News (Peoples Gas Light & Coke Co., Chicago, Ill.).
The Doherty News (Doherty Publishing Corporation, 60 Wall St., New York, N. Y.).
Gas and Electric News (Rochester Railway & Light Co., Rochester, N. Y.).
Gas Logic (Consolidated Gas Co., New York, No. 1 Madison Ave., New York, N. Y.).
Pacific Service Magazine (Pacific Gas & Electric Co., San Francisco, Cal.).
Service (Public Service Gas Co., Newark, N. J.).
Southern Public Utilities Magazine (Charlotte, N. C.).
U. G. & E. E. Bulletin (United Gas & Electric Engineering Corporation, 61 Broadway, New York, N. Y.).

Miscellaneous Publications.

Aera (American Electric Railway Association, 8 W. 40th St., New York, N. Y.).
General Electrical Review (General Electric Co., Publication Bureau, Schenectady, N. Y.).
Printers Ink (185 Madison Ave., New York, N. Y.).
Public Service (122 S. Michigan Ave., Chicago, Ill.).
System (Wabash Ave. and Madison St., Chicago, Ill.).

Data is listed from periodicals received at Association Headquarters up to the tenth of the current month.

NOTE.—The following list includes references to articles published from January 10 to February 20, 1919.

ASSOCIATIONS AND COMMITTEES.

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Dutch Assn. of Gas Engineers (Groningen, Holland, July 11-12, 1918)		Gas Jour., Jan. 7, 25; Jan. 14, 72; Jan. 21, 119
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Illinois Gas Assn. (Annual Meeting, Chicago, Mar. 19-20)		Gas Age, Feb. 1, 147; Feb. 15, 219
Illuminating Engineering Soc. (Phila. Section, Dec. 20, 1918)		Gas Age, Jan. 21, 59
Institution Gas Investigation Committee		Gas World, Jan. 25, 52-53 Gas Jour., Jan. 28, 167
Iowa District Gas Assn. (Lincoln, Neb., May 21-22)		Gas Age, Feb. 15, 202
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Ammonia, Concentrated Commercial Liquor and Its Impurities	Dr. H. G. Colman	Gas Jour., Jan. 7, 23 Gas World, Jan. 11, 19
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Coke, Estimating Percentage of Ash in	J. Hughes	Gas World, Jan. 18, 44
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Coke Ovens, By-product	W. E. Steinwedell	Gas Age, Jan. 1, 15
Coke Oven Gas—Cheap Fuel		Gas Age, Jan. 1, 16
Coke Oven Possibilities	Editorial	Gas Age, Jan. 15, 91
Coke Oven Practice—Economic Considerations	M. W. Blythe	Gas World, Jan. 4, 21
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Cooking—Gas vs. Electric Heat		Gas World, Dec. 30, 1918, 403
	A. Gosden	Gas Jour., Jan. 14, 74
	Editorial	Gas Age, Jan. 1, 33
Die Casting with Gas		Am. G. E. Jour., Feb. 15, 139
Electricity Made with Gas		Gas Age, Jan. 1, 37
Electrode Manufacture with Gas		Gas Jour., Jan. 28, 170
Fire Engines Keep up Steam with Gas		Gas Age, Feb. 15, 201
Fuel Costs, Relative	L. S. Bigelow	Gas Industry, Jan., 15
Gas Appliance Testing Laboratory	H. M. Riley L. B. Wilson, Jr.	Am. G. E. Jour., Feb. 8, 117
Gas Engine Indicating		Gas World, Jan. 18, 37
Gas Helped Win War	R. E. Livingston	Gas Record, Jan. 22, 45
Gas in 21 Manufacturing Processes	F. M. Lester	Gas Age, Jan. 15, 102
Gas Traction Developments	E. S. Shrapnell-Smith	Gas World, Jan. 11, 17
Hospital Uses Gas (Atlanta, Ga.)		Gas Age, Feb. 1, 146
House Heating Maintenace		Gas Age, Jan. 1, 37
House Heating—Merits and Demerits		Gas World, Jan. 18, 36
Heat Utilization	Editorial	Gas Age, Feb. 1, 143
Industrial Fuel—Gas		Gas Industry, Jan., 21
	T. King	Am. G. E. Jour., Feb. 8, 113

ARTICLE	AUTHOR	PUBLICATION
Laboratory, Gas Consumers (Brooklyn, N. Y.)		Gas Age, Jan. 1, 35
Light, Cheap	Dr. W. Clark	Gas & Elec. News, Dec., 1918, 128
Lighting Companies Benefited by Reaction	J. E. Bullard	Am. G. E. Jour., Feb. 1, 89
Newspapers as Consumers	G. C. Shadwell	Gas Record, Jan. 8, 1
Nomenclature (Report of committee)		Trans. I. E. S., Dec. 30, 1918, 473
Office Lighting, Modern Practice		Gas World, Jan. 25, 61 Gas Jour., Jan. 28, 170
Open Flame Furnaces, Surprising Results	L. T. Clark	Am. G. E. Jour., Feb. 1, 91
Power Costs—Gas and Steam	Editorial	Gas Jour., Feb. 4, 210-217
Public Lighting, Resumption of	T. Newton	Gas Jour., Jan. 14, 70
Pyrometer—Signalling		Am. G. E. Jour., Jan. 11, 36
Refractory Material—Kiln Gas-fired (Ceramic Society)	A. Bigot	Gas World, Jan. 11, 23 Gas Jour., Jan. 14, 71
"Roto-flam" Gas Furnace		Gas World, Feb. 1, 76
Saving Fuel in the Home	H. O. Stewart	Gas & Elec. News, Dec., 1918, 134
Street Lighting (Committee report)		Trans. I. E. S., Dec. 30, 1918, 473
Water Heating	Editorial	Gas Jour., Jan. 14, 64-74

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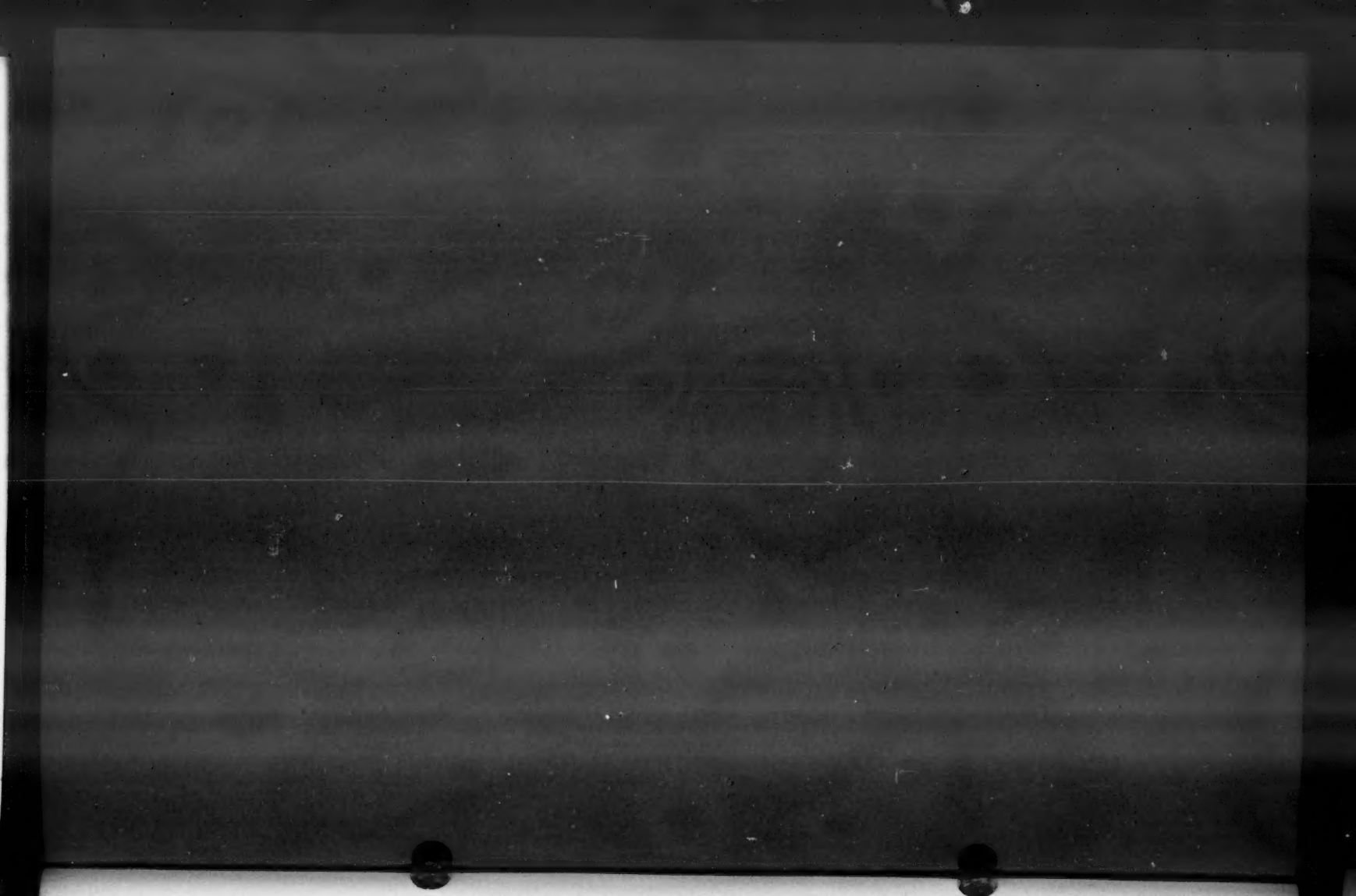

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